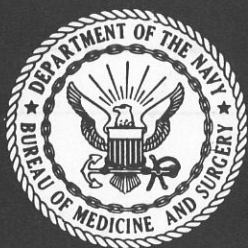


NOV 6 1968

cop 2

NAVMED P-5088



UNITED STATES NAVY Medical News Letter

Vol. 52

Friday, 18 October 1968

No. 8



CONTENTS

MEDICAL ARTICLES

Stomal Care	1
Pain in the Face	3
Radiopaque Filled Foley Balloon in Posterior Epistaxis	9
Friedlander's Pneumonia	10
Lycoperdonosis	14

MEDICAL ABSTRACTS

Resuscitation and Management of Shock on the Battlefield	16
Changing Concepts in the Epidemiology of Viral Hepatitis	17
Identifying the Tuberculous Infected	17
Epidemiologic Study of <i>Cryptococcus neoformans</i> ..	17

DENTAL SECTION

The Role of Minor Orthodontics	18
Mediastinal Emphysema Produced by Air Turbine Dental Drills	18
The Effect of Hyperbaric Pressure on the Marginal Leakage of Amalgam Restorations	19
Far East Chapter Association of Military Surgeons of the U. S.	19

NURSE CORPS SECTION

Man Your Patient Handling Stations	20
------------------------------------------	----

RESEARCH SECTION

List of Recent Publications From Research Laboratories	22
--------------------------------------------------------------	----

AEROSPACE MEDICINE SECTION

Potential of the Helicopter for Civilian Medivac ...	23
Fit to Fly	26
News of Personnel	26

EDITOR'S SECTION

Dangers Associated With Oxygen Therapy in New-born Infants	27
Hepatitis Prophylaxis	28
Naval Reserve Hospital Corpsmen Complete Refresher Training	28
Ophthalmology Association Recognizes Navy Technicians	28
BUMED Film Releases	29
Carcinoma of the Bladder	29

MADIGAN GENERAL HOSPITAL
MEDICAL LIBRARY
PROPERTY OF U. S. ARMY

United States Navy
MEDICAL NEWS LETTER

Vol. 52

Friday, 18 October 1968

No. 8

Vice Admiral Robert B. Brown MC USN
Surgeon General
Rear Admiral G. M. Davis MC USN
Deputy Surgeon General
Captain J. J. Downey MC USN, Editor
William A. Kline, Managing Editor
Contributing Editors

Aerospace Medicine	Captain M. D. Courtney MC USN
Dental Section	Captain H. J. Towle, Jr. DC USN
Hospital Administration	Captain R. M. Tennille, Jr. MSC USN
Nurse Corps Section	CDR A. M. Byrnes NC USN
Occupational Medicine	Captain N. E. Rosenwinkel MC USN
Preventive Medicine	Captain C. H. Miller MC USN
Radiation Medicine	Captain B. K. Hastings MC USN
Research Section	Captain B. F. Gundelfinger MC USN
Reserve Section	Captain C. Cummings MC USNR
Submarine Medicine	Captain B. K. Hastings MC USN

Policy

The U.S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, sus-

ceptible to use by any officer as a substitute for any item or article, in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to Editor: Bureau of Medicine and Surgery, Department of the Navy, Washington, D.C. 20390 (Code 18), giving full name, rank, corps, old and new addresses, and zip code.

FRONT COVER: NAVAL HOSPITAL, PATUXENT RIVER, MARYLAND. The Station Hospital at the Naval Air Station, Patuxent River, Maryland was reclassified as a Naval Hospital and commissioned as such 1 July 1968. The air station was originally built with its supporting facilities in 1942, 1943 and 1944, and has been a leading flight test center. Over the years after World War II, the station was expanded and modified and the medical workload increased. In 1957 the number of personnel, including Navy and Marine Corps, dependents and civil service employees, entitled to medical care at government expense totaled 13,409. In 1959 the nearest armed forces medical facility was at Andrews Air Force Base 50 miles away, and the nearest civilian hospital was the St. Mary's Hospital at Leonardtown, Maryland 12 miles away. In February 1968 the total population supported was 16,692, including personnel attached to the various flight squadrons and miscellaneous activities. The hospital is a BUMED command and support activity with area coordination by the Commander Naval Air Test Center, Naval Air Station, Patuxent River, Md. The hospital provides inpatient and outpatient care for the indicated active duty personnel, civil service employees and dependents. Patients with chronic conditions requiring care beyond the hospital's capabilities, are transferred to the Bethesda Naval Hospital. The Senior Dental Officer of the air station has been given additional duty to the hospital as Special Assistant to the Commanding Officer, and a junior dental officer and dental technician formerly assigned to the Air Station have been given primary duty at the hospital. The hospital has a normal bed capacity of 217 beds, an expanded bed capacity (on 6-foot centers) of 256 beds, and, as of 1 August 1968, has 50 operating beds. A new hospital structure is under construction but some of the former or existing buildings will be retained for use.

The issuance of this publication approved by the Secretary of the Navy on 4 May 1964.

U.S. NAVY MEDICAL NEWS LETTER VOL. 52 NO. 8

STOMAL CARE *

John L. Rowbotham, MD, New Eng J Med 279(2):90-92, July 11, 1968.

Intestinal stomas are usually easy to care for because of new appliances and materials that lend themselves to a variety of stomas. Each colostomy, ileal bladder and ileostomy has its own characteristics, and each behaves differently at different times, depending upon many factors. Fatigue, disease, emotions and the normal variety of foods eaten daily can have a profound effect on a stoma and its function. This is particularly true of a colostomy.

Traditionally, it is taught that a colostomy patient can acquire control easily, and after learning to irrigate his colon, he can usually, but not always, expect to be clean and dry between irrigations: this basic tenet does not take into consideration the location of the colostomy in relation to its distance from the ileocecal valve. Right-side bowel feces tend to be liquid and irritating, and left-side feces to be solid and nonirritating.

It is reasonable to expect that the bowel habits of a person with an end sigmoid colostomy will be the same as they were before his illness and surgery, provided he returns to his previous eating habits. Irrigating a colostomy may coincide with the normal bowel elimination routine, or it may conflict. Some colostomies work because of irrigations; some work in spite of them. Stoma care of people who try and fail to have good colostomy control by diet and irrigations is difficult. One speaks of colostomy control as of bowel control or toilet training to an infant, when failure to stay clean or prevent an "accident" implies inability to learn or to develop a function that is closely bound to customs and living habits.

Colostomy control in the absence of a competent colostomy sphincter is not possible. To have a sense of security and self confidence, patients must be advised about collecting devices. The method of diet and irrigation is successful for some people at some times. Ileostomy patients, with their specific problems, adapt more readily to a permanent collect-

ing bag, because they know from the onset that they will never have bowel control. They do not expect to be continent. Continence is implied to the colostomy patient; thus, he faces a collecting device with reluctance, considering its use a sign of failure.

Colostomy care by the irrigation method is not universal. It is popular in the United States, but not in Great Britain. Accidental perforation of the colon by irrigating tubes has led many surgeons to abandon the routine of colostomy irrigations.

Of all stomas the right transverse colostomy is the most difficult to manage. This colostomy, with liquid feces running almost constantly, is malodorous, irritating to the skin, large and bulky and requires an oversize collecting device. Gauze pads and bulky dressings alone do not serve well here.

All colostomy patients should have and should know how to use a colostomy bag. Stoma appliances should be ordered, or at least planned for at the time of surgery.

A knowledge of equipment and materials is necessary if a surgeon is to care for any stomas under all conditions. There are many types of temporary and permanent ileostomy and colostomy bags. All basically are the same except for one with a separate rubber washer that is placed around an ileostomy and serves to prevent cutting or shearing of the stoma by virtue of its texture and position between the face plate and collecting bag.

Temporary bags are to be used once and discarded. They are generally of clear plastic, have open or sealed ends and are modified to have adhesive backing with added flaps for belts or a karaya-gum ring for stoma protection.

Permanent bags, made to last for several months, are usually of natural or synthetic rubber. They are affixed to a rigid face plate with a hole made carefully to conform to the shape of the patient's stoma and to the obvious body landmarks of pubis, umbilicus, iliac crest and costal margin. Permanent appliances are worn on ileostomies and ileal bladders, and temporary bags on colostomies.

*Address reprint requests to Dr. Rowbotham at 110 Francis St., Boston, Mass. 02115.

It is advisable to hold an appliance in place so that body motion and shifting of the appliance will not cause cutting or other injury to the stoma. Resin alcohol or tincture of benzoin on the skin around a stoma works well with the usual adhesives. A word of caution: tincture of benzoin *compound* is very irritating and should never be used under an appliance. Rubber cement and silicone adhesives are stronger and more durable than resin adhesives, and therefore should be used with the permanent ileostomy bags. No adhesive should ever be applied without a previous patch test. For some patients double-faced adhesive disks may be easier to handle than ileostomy cement or spray adhesive.

Karaya gum, a natural gum resin, is probably the most important single item in good stoma care. It is supplied in powder form or in disks or sheets made of karaya and glycerine. It is the only substance that can safely be placed on raw peristomal skin and have an appliance cemented over it while healthy skin grows under it. The powder is lightly dusted over moist skin or burned, weeping skin, and a thick, tenacious, gummy film quickly forms. This sticky karaya film gives the protection. Ileal discharge, feces or urine do not quickly wash it away or penetrate it. Ileostomy cement will stick to it. It is not an allergen and it does not cause skin sensitivity. It can be used either as a powder or as a disk or washer around a stoma. Karaya disks eliminate the need for very accurate stoma appliance measurement because they can be made to fit snugly around the stoma mucosa leaving no skin exposed to corrosive wastes.

Large sheets of karaya are effective dressings for skin burned by digestive enzymes. They are effective also because they can be tailored to fit a stoma exactly, to guard the underlying skin, and still be able to hold an overlying collecting device. The rod under a loop colostomy usually interferes with an appliance, but with ingenuity the skin of even these difficult colostomies can be protected by karaya-gum powder or rings or sheets. Karaya gum is indispensable.

Peristoma skin is always vulnerable, despite good care and proper appliances. Hygiene is most important. A bath or shower should be taken every time a bag is removed. Soap and water do not hurt stomas, but soap left on the skin around a stoma can interfere with the adhesives or can irritate the skin. Plain water or hexachlorophene is best for daily appliance change technics. It is not important to remove all old skin cement when an appliance is

changed. The solvent in itself may not be irritating, but abundant use of it with harsh rubbing of the skin may cause pain and damage. General cleanliness and removal of most of the old cement and karaya gum is all that is important. Minor skin irritations can be treated with either an antibacterial or fungicidal material in powder or vanishing-cream base. Vaseline interferes with the actions of adhesives. Minor lesions can heal even when collecting bags are worn. A major stoma problem such as a fistula, peristomal abscess or stoma laceration must be treated as a surgical problem, but a different appliance is indicated at least temporarily. An improper or a leaking appliance creates an emergency that must be treated by immediate appliance change.

The characteristic odor of fecal wastes and appliances is inevitable. The natural odor of feces depends upon the food eaten and bacterial fermentation. Something can be done about odor beyond avoidance of foods that give objectionable odors. Although chlorophyl and charcoal tablets afford little help, bismuth subcarbonate, 0.6 gm, taken three times a day with meals has a striking effect in reducing bad odor, both from feces and from the bags. There are many commercial products that can help reduce odor. In liquid form they are placed in the appliance pouch. Sodium benzoate, 20 drops, or aspirin, 0.6 gm crushed and dissolved, is helpful in reducing odor. Pouch odors are controlled by frequent changing and by meticulous care in washing and drying.

The easiest ileostomy to care for is one that protrudes for several centimeters. A temporary collecting bag should be applied in the operating room to give protection from the start. It lets the surgeon see the stoma at all times, and it can be attached to a drainage tube to carry away the excretions without frequent bag changes. During the first 14 days after operation, as the edema subsides the temporary appliance is proper. After the second postoperative week, the permanent appliance may be acquired and worn. The face plate stoma should be only $\frac{1}{8}$ th inch in diameter greater than the diameter of the stoma. This leaves a minimum of exposed skin and allows room for normal stoma expansion from time to time.

Ileal bladders have their own particular problems. But in general they are managed like ileostomies, with some modifications in the pouches.

The successful management of an ileostomy or an ileal bladder depends upon its site and construction.

A flush ileostomy leads only to problems, for flush or funnel stomas do not work well with any appliance; there is too much slipping and leakage and ultimate skin erosion. Although a flush ileostomy is difficult to manage, a flush colostomy may be preferred. Surgeons are beginning to make mature colostomies as a primary part of their operations. Even the loop colostomies can be sutured to the skin in such a way as to avoid the edematous colon, which customarily takes weeks to shrink down.

If the surgeon wants his patient to manage the colostomy by irrigations, it is still proper for him to begin by putting a temporary collecting bag on the stoma in the operating room. Such bags are large enough to accommodate almost any size of stoma in any location. They can be cut to size and stuck on over a large karaya ring if so desired. They help to keep the stoma clean from the beginning. A sigmoid colostomy often drains liquid stool at first; the initial eruption discourages a patient.

Finger dilatation of any stoma should be done with

caution, and only by a physician. A stoma that needs dilatation to function needs revision. Dilatation usually causes mucosal and skin tearing, which in turn leads to local infection, more fibrosis and eventual greater stricture formation.

No stoma patient should be discharged from the hospital without having his complete permanent equipment and without full knowledge of its care. An extra day spent in the hospital learning to change and manage an appliance may save a patient many hours of problems at home.

The creation of a stoma should stir in the mind of the surgeon a thought about its ultimate management. This can lead to a positioning of stomas in a way that will best accommodate one of the many appliances available. Better management of stomas will be achieved when their care becomes individualized.

(The bibliography may be seen in the original article.)

PAIN IN THE FACE *

Henry Miller,† MD, FRCP, DPM, "Reprinted from the British Medical Journal 1968, 2, 577, by permission of the Author and Editor."

In the neurological outpatient clinic there are some presenting symptoms that daunt the physician, and others that immediately sharpen his interest. A complaint of dizziness, for example, falls into the first category. It means so many different things, from cataclysmic aural vertigo to a middle-aged woman's vague feelings of anxious insecurity in a crowded shop, while the pathophysiological basis of the symptom is poorly understood. The physician knows that even after a careful history and examination, and the employment of special tests, it is quite likely that he will find himself unable to account for the clinical phenomena in a really satisfactory way. Among the second category of primary symptoms that immediately arouse the neurologist's interest, pride of place must go to episodic attacks of loss of consciousness, usually comprehensible on a careful clinical history alone, and a never-failing source of fascination. Among these another is pain in the face.

A neurologist in a general hospital, and especially one associated with a dental hospital, sees many patients with this complaint. Our dental colleagues have usually dealt with the dental aspect of cases they refer to us, and these are often difficult and unusual. Unfortunately specialists in other fields are sometimes less well informed, and I have seen an old lady with trigeminal neuralgia tube-fed for days in a peripheral hospital because the nature of her agonizing and remediable pain had completely escaped recognition.

The definitive diagnosis of facial pain is not always easy, and indeed, if it were, the subject would lack its clinical interest. My account will begin with a number of more or less well defined syndromes and progress to more confused and problematical categories.

Trigeminal Neuralgia

Of all forms of facial pain trigeminal neuralgia is the most clear-cut and characteristic. It is a disease of the elderly. Curiously enough, in tropical countries the mean age of onset appears to be distinctly

* McCurrich Oration to the Regional Hospitals' Consultants and Specialists Association at the Royal College of Surgeons of England on 17 May 1968.

† Professor of Neurology in the University of Newcastle upon Tyne.

lower, but so, of course, is the expectation of life—perhaps this represents nothing more than the telescoping of the patient's life-history. Here, however, it most characteristically affects patients in the sixties, seventies, and eighties. The pain is unilateral and entirely limited to the trigeminal distribution, and practically always first affects either the second or third division of the nerve, spreading only later, if ever, to the first division; it is most exceptional for trigeminal neuralgia to begin with pain in and around the eye. It comes in a succession of short, sharp, momentary bursts like electric shocks or machine-gun fire. Mild but otherwise typical cases are uncommon, and the pain is usually excruciating, immobilizing the patient's face except perhaps for agonized twitching (hence the name *tic douloureux*), and sometimes causing him to press his hand to his face with an expression of profound distress. Periods of complete relief are continually interrupted by volleys of pain that are always a reflex response to some form of sensory stimulation—speaking, eating, touching the face, especially at a "trigger zone" such as the nostril or the angle of the mouth. A loud noise or a cold wind may have a similar effect; since the pain is reflex it rarely disturbs sleep. A series of such episodes may occur many times a day for several weeks, to disappear completely for many months. But the pain returns, extending more widely—though still strictly within the fifth-nerve distribution—in the course of time, and with remissions that become briefer. The word "never" is unknown to medicine, but I have yet to see spontaneous cure of this disorder, and this common experience profoundly influences our approach to treatment.

The age of the patient, the character and distribution of the pain, and the remittent history are invariable features of trigeminal neuralgia, but there are others almost equally striking that must be satisfied for a firm diagnosis. The most important of these is that *there are no physical signs, either sensory or motor, of a structural lesion of the fifth nerve*. If loss of sensation or impairment of the corneal reflex is present the condition is not trigeminal neuralgia: the nerve is affected by structural disease such as the pressure of an eighth-nerve tumour or an aneurysm, or erosion by a nasopharyngeal cancer.

Though most cases of trigeminal neuralgia arise in old age or late middle life, and though the diagnosis in younger patients is usually incorrect, the condition is occasionally seen in its classical form in

young people. In such cases the neuralgia is not infrequently accompanied by signs of pathological involvement of the long tracts of the spinal cord, especially in the form of absent abdominal reflexes or extensor plantar responses, and is a symptom of multiple sclerosis. Most often neuralgia develops during the course of the chronic disease and behaves exactly like the idiopathic syndrome. Very occasionally, like facial palsy, it may herald multiple sclerosis. In my experience this chronic nervous disease also furnishes most of the few cases where trigeminal neuralgia is bilateral, affecting either side alternately. Treatment of the condition in multiple sclerosis is exactly the same as in other cases.

Treatment

Except for a handful of enthusiastic experts, alcohol injection of the Gasserian ganglion has lost its vogue—the technique is difficult and the result unpredictable. Nor has division of the sensory tract in the midbrain achieved much popularity in Britain, the operation being regarded as unduly hazardous. Treatment by partial section of the sensory root of the fifth nerve is the most widely practiced approach. Attempts to limit the extent of fibre section to spare the first division of the nerve, and hence to avoid corneal analgesia with its attendant risks, imply a small risk of postoperative recurrence. Furthermore, the operation leaves a sometimes disagreeable numbness of the face. The patient with severe pain is glad to exchange it for sensory loss, but where the neuralgia has been in remission, or relatively mild, he may complain as bitterly about the postoperative result as he did about the condition for which it was performed. Nor does he share the doctor's awareness that his condition will certainly recur. For this reason the patient with trigeminal neuralgia should not be put on a waiting-list, but advised to report back for operation during an attack, so that he will be fully aware that his severe pain has been cured at the cost of mildly troublesome paraesthesiae.

The introduction of Tegretol (carbamazepine) has transformed the therapeutic situation in this disorder, and already surgical hands are prone to lose their cunning in sensory root section. Carbamazepine is an imipramine-like drug, originally introduced as an anticonvulsant, and it has a remarkably specific effect on the pain of trigeminal neuralgia, which has resisted virtually every previous analgesic. The effect is so specific that in outpatient practice we now use the drug as a diagnostic test. It is toxic, and often causes headache, dizziness, and drowsi-

ness, but there are few patients who cannot tolerate it if the dose is gradually built up over the course of a few weeks from half a tablet (100 mg) to something like six tablets daily.

Early reports of blood dyscrasias as a result of the administration of carbamazepine caused considerable alarm, made neurologists timid in its use, and have so far precluded its introduction into medical practice in the United States. However, the complication is rare and one that must be faced with many effective modern drugs. It constitutes no contraindication to the use of this preparation in trigeminal neuralgia, since the small risk of surgery even in the most skilled hands remains greater than the danger of the very occasional catastrophic complications of carbamazepine. Many of these patients are elderly and decrepit, and operation and anaesthesia of any kind carry some risk. The tendency to spontaneous remission means that few patients will need the tablets continuously throughout life, and if response is satisfactory, and if a dose effective enough to preclude more than a twinge of pain in the morning (before the first tablet has been taken) can be tolerated, operation can be avoided. In the younger patient the situation is different. The risks of toxic complications increase with the amount and duration of dosage, and in severe cases successful operation will avert the risk of drug toxicity during the many years that lie ahead.

In practice, the introduction of carbamazepine has led to a remarkable reduction in the number of operations undertaken for trigeminal neuralgia: recent reports of its use describe successful treatment of trigeminal neuralgia in about 75 percent of cases. Today the main indication for surgery is the patient's inability to tolerate effective dosage without uncomfortable minor toxic symptoms. In this connexion, and especially in older patients, there is something of a swing back to less radical surgery, involving perhaps division of the submental nerve when the main trigger zone is in the lower jaw. Since (unlike alcohol injection of the ganglion) these measures in no way jeopardize later resort to root section where this proves necessary, there is nothing against such a limited peripheral approach.

Glossopharyngeal Neuralgia

The only condition other than tic douloureux in which I have found carbamazepine to be effective is its very much rarer analogue affecting the glossopharyngeal nerve. This condition does not share the predilection of trigeminal neuralgia for old age, but

it is similarly intermittent and causes agonizing paroxysmal pain of identical quality in the ipsilateral tonsillar bed and often also in the auditory meatus. The condition is not well known, and all my own cases have been subjected to long and ineffective courses of psychotherapy for "hysteria" before somebody—usually a competent psychiatrist—has tumbled to the correct diagnosis. Carbamazepine may be remarkably effective, but, if it is not, the condition can be cured either by avulsion of the glossopharyngeal nerve in the neck or by the rather more major procedure of its division in the posterior fossa.

It is curious that we have no clear idea of the pathology either of trigeminal or of glossopharyngeal neuralgia. In the case of the former its age-incidence suggests a relation with arteriosclerosis, but if the syndrome is ischaemic it is strange that irritative phenomena do not at some stage give place to the objective sensory deficit that would bespeak infarction.

Post-herpetic Neuralgia

Post-herpetic neuralgia is a complication of shingles in the elderly, and hardly occurs before middle-age. Usually seen at its worst where the eruption has been severe, it may of course affect any part of the body, but many of the most distressing cases involve the trigeminal distribution, causing intense facial pain. Diagnosis is not often difficult, except in the occasional instance where the skin eruption has escaped notice and may be evident only as one or two small insensitive tissue-paper scars within a wider area of hyperaesthetic skin.

At its worst the pain may be as severe as tic douloureux, but its behavior is quite different. Severe pain arises spontaneously, without reflex excitation, and persists steadily for half an hour or more, in contrast to the paroxysmal bursts of trigeminal neuralgia, while it also often disturbs sleep. Some patchy loss of superficial sensation is usually present at the site of the healed eruption. But the most important difference between the two conditions is that post-herpetic neuralgia tends to improve, and indeed practically always does so, even if the process takes 6 to 18 months—except for a handful of cases in which the patient denies improvement over several years.

The natural history of the disorder determines its management. In this connexion it is important to remember that while the maximal incidence of pathological change in zoster infection is seen in the

posterior root ganglia, the infection of the nervous system is general, and the sensory pathways especially are involved at every level up to and including the thalamus. This is probably why injection or division of the sensory root of the trigeminal or any other nerve rarely relieves the pain, and is contraindicated. Posterior rhizotomy and even prefrontal leucotomy have proved equally ineffective. Indeed, the only surgical measure that has brought relief in the most obstinate cases is stereotaxic thalamotomy—and even this is all too often temporary.

Whether or not the picturesque hypothesis of reverberating pain circuits following facilitation consequent on initially extreme stimulation is more than a fancy, there is a strong clinical impression that the condition arises most severely when control of the pain of the acute attack has been inadequate—which in a disorder so well known to cause intense pain is in any case unforgivable. The older patient with an acute attack of painful shingles deserves powerful analgesics. The observation that subsequent neuralgia is often most severe where there has been extensive superficial tissue destruction has led some to advise the use of steroids in the acute phase, though by others these are regarded as contraindicated on the theoretical grounds that they might diminish protection against spread of the virus. The employment of an antihistamine drug might represent an acceptable compromise.

By the time the patient with post-herpetic neuralgia presents as a case of facial pain the problem is one of analgesia. A background of 50 to 100 mg of chlorpromazine three times a day (or even more) potentiates the action of an analgesic. During the day compound codeine tablets or something similar may be enough, constipation being kept at bay by Senokot. Even at night 50 mg of pethidine or 5 mg of Physeptone (methadone hydrochloride) may suffice, but in severer cases I follow Sir Charles Symonds in prescribing a powder comprising $\frac{1}{8}$ gr (8 mg) of heroin and 10 gr (0.65 g) of aspirin, one powder to be taken before retiring and a second kept by the bedside in case of need. This preparation can be virtually guaranteed to give the patient the reasonable night's sleep that will make daytime pain or discomfort at any rate tolerable. The truism that addiction is a function of the addict rather than the drug is supported by long experience of this regimen: the patient herself usually takes the initiative in cutting the dosage and finally abandoning the powders when they are no longer needed. If the choice were put to me I would in any case rather

have a cheerful pain-free 80-year-old addict than a miserable ancient dying exhausted by pain, sleeplessness, and malnutrition—but I have never had to make the choice. The attitude of some members of the profession to heroin can only be described as neurotic. The drug has saved some of these unhappy patients' lives, and to dispense with an invaluable preparation because it is abused by a handful of people is as sensible as to prohibit the distillation of whisky on similar grounds.

Migrainous Neuralgia

Among other well-defined causes of facial pain, one of those least familiar to the generality is the condition variously known as migrainous, ciliary, or sphenopalatine neuralgia, "histamine headache" (on the dubiously relevant basis that the injection of histamine may provoke a typical attack in a sufferer), and—perhaps best of all—"cluster headaches." This vivid transatlantic term epitomizes the characteristic tendency of the syndrome to remit completely for many months and to recur in the form of a series of frequent attacks over the course of a few weeks.

The clinical picture is remarkably consistent. The typical patient is a young or middle-aged man, sometimes with a family or past history of true migraine, subject to attacks of fierce facial pain, centred behind the eye, always on the same side, often with running of the eye and stuffiness of the nostril on the side of the headache. Attacks often disturb sleep, sometimes with the regularity of an alarm-clock, and last for 30 minutes or more with an intensity that may make a phlegmatic man weep with pain.

Migrainous neuralgia thus shows features suggestive both of migraine and of tic douloureux, and if they are remembered they will protect many patients from unnecessary angiography and air encephalography—procedures sometimes undertaken in such cases where clinicians have failed either to take a careful history or to appreciate its significance. The effect of ergotamine tartrate on migrainous neuralgia is virtually specific, and more impressive than in the case of migraine itself. Such patients may be severely incapacitated, and it is often wise to admit them to hospital for a few days so that they can be taught to inject subcutaneous Femergin (ergotamine tartrate) (0.5 mg three times a day, or on retiring in purely nocturnal cases) for a week or so. This almost invariably stops the episode at once, and can be repeated by the patient when the pain recurs—as it almost certainly will—after an interval

of many months. A very occasional case is resistant, and in these cases the possible efficacy of stellate ganglionectomy can be assessed by the response to stellate ganglion block during a paroxysm.

Until I discovered that Wilfred Harris carried out this procedure for the same condition nearly half a century ago I regarded it as a departmental contribution to therapeutics. Our own experience with this method has been remarkably successful, but reports from reliable colleagues indicate that we have been lucky, and that something like 50 percent success is the most that can be expected. The nature of migrainous neuralgia remains uncertain. However, the evidence suggests that it arises from an anomaly in the innervation of the carotid circulation, and that ganglionectomy relieves the pain by interrupting the autonomic pathway.

Costen's Syndrome

Named after an American dental surgeon, this syndrome comprises pain originating in the region of the temporomandibular joint and radiating forward over the cheek and face, brought on by chewing. The pain is sometimes severe, but likely to be confused with trigeminal neuralgia only if history-taking is either slipshod or uninformed. In contrast with tic douloureux the pain is activated only by chewing and not by any of the other familiar "triggers" of the more serious disorder, while the temporomandibular joint on the affected side is often tender on firm pressure.

Costen's syndrome is associated with over-closure of the bite or with the change in shape of an edentulous jaw, and is caused by sliding forward of the mandibular condyle with consequent arthropathy. It may be relieved by "building up the bite" with plastic prostheses placed over the lower molars. The benefit yielded by this artificial limitation in the excessive mobility of the mandible is usually immediate but not always maintained; in a few severe and intractable cases the aid of an oral surgeon must be invoked and an operation carried out on the joint, usually with an excellent result.

Structural Causes of Facial Pain

In facial pain due to a structural lesion involving the trigeminal nerve there is usually a short history and some sensory impairment on examination. In the earliest stage this may amount to no more than some blunting of the corneal reflex on the affected side, but if it is genuine this is highly significant.

Such pain is rarely paroxysmal, though in very occasional cases of acoustic tumour intermittent pressure on the nerve may simulate trigeminal neuralgia, especially if involvement of the seventh nerve also causes hemifacial spasm. This suspicion always arises where either fifth or seventh nerve involvement is associated with ipsilateral deafness; corneal insensitivity is a crucial finding, and where any suspicion arises expert otological assessment should be sought, in addition at least to radiological examination of the internal auditory meatus and measurement of the protein content of the spinal fluid.

Nasopharyngeal carcinoma is an unpleasant disease with which the clinician often becomes familiar only through a series of mistakes. Long before pain or a tell-tale blood-stained nasal discharge appears, and sometimes even before the growth can be seen by the surgeon under general anaesthesia, the lesion may be announced by a painless ophthalmoplegia. However, when pain appears it is often severe and intractable. Again the timidity of doctors in relation to analgesics is baffling. Patients whose outlook is hopeless and whose pain is appalling are referred to neurosurgeons with a view to operative division of sensory pathways when inquiry shows they are having nothing more than a few compound codeine tablets daily, and that—save the mark—the surgeon "has successfully weaned" the sufferer from stronger drugs. Such statements bespeak an attitude that regards pain an ennobling rather than demoralizing, and that endows a mutilating operation with some strange moral superiority over the use of such splendid euphoriant analgesics as heroin and cocaine. In the case of malignant disease certain to kill within months, surgery should be invoked only when pharmacology has failed—and in these circumstances the result will often be euthanasia, even when such an intention was far from the surgeon's mind.

Intracranial aneurysm arising from the posterior communicating artery is a classical cause of first-division trigeminal pain, usually with oculomotor palsy. The lesion can be visualized by angiography and the pain relieved by common carotid ligation.

Dental Pain.—The days when every outpatient with trigeminal neuralgia had been rendered edentulous in the pursuit of relief are past, but it is important to recall that dental disease is still the commonest cause of facial pain—and that its provocation by hot, cold, or sweet food is virtually pathognomonic.

Psychosis

In an occasional case facial pain is symptomatic of psychotic illness, usually agitated depression. The painful syndrome lacks the definition of those previously described, and diagnosis depends on recognition of the other features of endogenous depressive illness. The patient is usually middle-aged, agitation is prominent, and sleep is characteristically disturbed, with early waking. Depression itself is less often a presenting feature than admitted in response to direct questioning. As with another even more typically depressive symptom—the complaint of severe and persistent pain in a normal tongue—hypochondriacal fears of cancer are often unspoken.

In some of these patients improvement of the depressive condition with appropriate drug treatment is accompanied by fading of the facial pain. However, in more than half the patients depression improves without amelioration of the painful syndrome. Improvement in mood and general condition makes the pain less distressing, but the grateful patient insists it is still present, unaltered but bearable. Such patients are among those comprised in a larger group of cases of "atypical facial pain."

Atypical Facial Pain

Cases of facial neuralgia that defy inclusion under the rubric of any one of the syndromes already described are unfortunately almost as common as those that lend themselves to classification. They also present a most discouraging prospect for treatment. The cause of the syndrome or syndromes is unknown, and if the patient shows no response to antidepressive drugs the chances are that she will show precious little response to anything else the doctor prescribes.

The typical patient is female, middle-aged, edentulous, haggard, and importunate. The pain is usually maximal in the distribution of the second division of the trigeminal nerve, of long duration, constantly present, sometimes unilateral but more often spreading across the midline or alternating from side to side. It has resisted the attention of a procession of dental surgeons and physicians, and often various forms of nerve block or surgical procedures on the jaws. Holes have been bored in the patient's sinuses on the doubtful premise that chronic pain analogous with the severe and localized variety typical of acute sinusitis is commonly caused by chronic sinus infection. Analgesic drugs yield only brief respite. All other measures have been of no

avail, and the patient presents herself again without much hope of relief. All too often she is right, and after a few unconfident and unsuccessful trials of various forms of empirical drug treatment she drifts off to some other doctor or clinic.

All doctors tend to attribute lack of therapeutic success to perversity, neurosis, or exaggeration—thereby excusing our failure, comfortably absolving ourselves from further effort, and placing the blame fairly and squarely on the patient's shoulders. Sometimes it is impossible to resist this temptation or to feel that it is unsupported by suggestive evidence: a good example is the occasional bright and cheerful victim of severe daily migraine who triumphantly announces the complete and utter ineffectiveness of yet another therapeutic routine with the arch smile of a contestant in a parlour game. Such considerations do not in my view apply in most instances of atypical facial pain. The patient looks ill and is often emaciated. She is clearly suffering, whatever the nature of her pain. The persistence of the pain after depression has been relieved is also suggestive, and despite its lack of clear definition I believe it probably arises on the basis of some form of pathophysiological disturbance, and is more than a purely mental entity or idea of pain. Again one is tempted to clutch at the straw of autonomic disturbance, but the emotional state of these patients usually renders them unsatisfactory subjects for surgical experiment, and I have not so far advised ganglionectomy or ganglion blockage even in the occasional wholly unilateral case. To the best of my knowledge I have never cured a case of atypical facial neuralgia, but I have known several who recovered during or after and almost certainly independently of my therapeutic efforts.

Summary

Facial pain is a common symptom in the neurological clinic and presents interesting and difficult diagnostic problems. The remittent paroxysmal pain of trigeminal neuralgia is the best-defined of all the syndromes encountered in this connexion. It is a disease of the elderly, shows considerable remissions, is unassociated with any abnormal physical signs, and always recurs. About three-quarters of all cases can be effectively relieved by Tegretol (carbamazepine), and in the remainder surgical section of the sensory root of the nerve remains the treatment of choice.

Post-herpetic neuralgia on the other hand shows little response to surgery but a marked tendency to spontaneous recovery, and is best treated by powerful

analgesics, including heroin in severe cases. Migrainous neuralgia or "cluster headache" is a well-defined syndrome of unilateral first-division pain, remarkably responsive to ergotamine, but often unrecognized. Among structural causes of facial pain temporomandibular arthritis, nasopharyngeal cancer, and intracranial aneurysm should be remembered.

It may also be a symptom of agitated depression and may respond to antidepressive drugs. There remains a considerable group of cases of distressing facial pain which lack the clear-cut characteristics of any of the forms described above, occur almost exclusively in middle-aged women, and resist every form of treatment but sometimes clear spontaneously.

RADIOPAQUE FILLED FOLEY BALLOON IN POSTERIOR EPISTAXIS

Arthur C. Fenn, MD, Chicago, Arch Otolaryng 87(2):171-173, February 1968.

Severe posterior epistaxis (severe nasal bleeding originating from an unseen point) is a problem which has confronted almost every otolaryngologist at one time or another. These severe hemorrhages usually have a habit of arising at the most inopportune moments, generally at night, or when one has an engagement elsewhere. Most of the methods used to control this type of bleeding are uncomfortable and generally unsatisfying. Therefore, this situation is quite an ordeal for the patient as well as the physician. This paper relates our experiences with one method which we have found to be very satisfactory in dealing with this problem.

The nasal blood supply has been studied very thoroughly by Burnham, Ogura and Senturia, and Batson. In this presentation, we can only mention in review, that the major arterial supply of the nose comes from the external carotid via the internal maxillary through its sphenopalatine branches; while a smaller portion, the anterosuperior, comes from the internal carotid via the ophthalmic artery.

The use of inflatable pneumatic packs for controlling hemorrhage is not new, since this idea was first patented as early as 1849 by Haile and in 1886 by Ashley. Other intranasal inflatable packs have been described by an Italian, Ignazio, in 1889 and later by Beck in 1916. In 1936, Stevens first introduced his intranasal balloon pack for control of epistaxis. It was first crudely constructed with the use of Penrose tubing and later improved by constructing a balloon which was molded to fit the gross contour of the nasal fossa. A modification of the Stevens' balloon was introduced by Ford in 1940. Stevens,

in 1951, after 15 years of experience with his balloon, introduced an improved model of his original rubber pneumatic pack.

Dr. Cyril Fox designed a postnasal inflatable pack which consists of a catheter 7 inches long assembled with a rubber bulb and a latex balloon. This device is similar to the Foley catheter but is specifically designed for use in the nose.

The use of the Foley catheter as a means of controlling posterior epistaxis has been previously described by Johnson in 1956, Gray in 1958, and Rege in 1964.

We studied 16 patients at the Cook County Hospital with posterior epistaxis requiring postnasal packing in which we used a Foley catheter. Our procedure was as follows: The patient was anesthetized with 2 percent tetracaine. We used a No. 14 or 16 French Foley catheter with a 30-cc balloon and a self-sealing rubber stopper or luer-lock valve. The tip of the catheter below the distal end of the balloon is cut and removed in order to eliminate irritation to the nasopharynx by this piece of excess tubing. The catheter is lubricated and inserted into the bleeding nostril in the deflated state. It is advanced along the floor of the nose until its tip is visible behind the soft palate. With the use of a 20 cc syringe, the balloon is partially inflated with about 8 cc of radiopaque contrast media. The Foley catheter is then gradually withdrawn until resistance is felt. At this point another 7 cc of contrast media is introduced into the Foley balloon. The catheter is then drawn taut so that the balloon fits snugly in the nasopharynx and posterior choana. Maintaining tension on the catheter and using the balloon as a posterior buttress, the anterior nasal chamber is packed with layers of ½-inch petroleum jelly gauze. A knot is then tied in the catheter at the level of the anterior nares, taking care to pack well around the knot to

Accepted for publication Aug 1, 1967.

From the Department of Otolaryngology, Northwestern University Medical School, Chicago.

Read before the Chicago Laryngological and Otolological Society, March 6, 1967 and winner of the Norval Pierce Competition.

Reprint request to Northwestern University Medical School, Department of Otolaryngology, 303 E Chicago Ave, Chicago 60611 (Dr. Fenn).

prevent pressure necrosis and retraction of the knot into the nasal cavity. The excess catheter is taped to the patient's forehead or cheek. The patient was then sent for x-rays which included a posterior-anterior and lateral view of the nasopharynx in order to observe for adequate filling and position of the balloon. The x-rays were repeated 24 and 48 hours after initial packing in order to follow maintenance of filling and maintenance of position of the balloon. The catheter was removed five days after initial insertion.

Our study brought us to the following conclusions:

Examination of the x-rays taken of the contrast fluid filled Foley balloons immediately after insertion demonstrated the balloons to be adequately filled with 15 cc of dye and well positioned, fitting snugly in the nasopharynx and corresponding posterior choana. Follow-up x-rays taken 24 and 48 hours after initial insertion demonstrated the position and filling to be satisfactorily maintained.

We found that the use of contrast fluid as an inflating agent reduced the chance of leakage from the catheter because its viscosity is greater than that of water.

Realizing that all types of postnasal packs cause discomfort to the patient, we observed that the discomfort experienced with an inflated Foley balloon was markedly reduced compared with other types.

The Foley balloon is recommended because it is

readily available in every hospital and in most physicians' offices.

The method of insertion of the Foley balloon is quite simple and can be performed within a few minutes.

The balloon lends itself to adjustment quite easily and simply without necessitating removal of the catheter, by merely adding or removing fluid and increasing or decreasing tension on the catheter so that the balloon fits snugly and firmly, and yet without undue pressure.

Withdrawal is quite easy and of no discomfort to the patient. One merely deflates the balloon by withdrawing the fluid and removes the catheter. It does not adhere to the mucosa upon withdrawal thus there is no traumatization.

Thus, in summary, we can say unhesitatingly that in our experience we have found the Foley catheter to have many advantages over other types of packing for the previously stated reasons and therefore, recommend its usage.

Jack Allan Weiss, MD, Chairman, Department of Otolaryngology, Cook County Hospital, suggested this study.

(The figures and references may be seen in the original article.)

FRIEDLANDER'S PNEUMONIA *

A REPORT OF 11 CASES AND APPRAISAL OF ANTIBIOTIC THERAPY

LT Neil R. Hoffman, MC USN** and Frank S. Preston, Jr. MD† Minneapolis, Minnesota, *Dis Chest* 53(4):481-486, April 1968.

The more common pneumonias, pneumococcal, viral, and mycoplasmin, usually respond well to current methods of therapy. *Klebsiella pneumonia*, as first described by Friedlander, is often resistant to therapy, and frequently runs a fulminant and fatal course (Table 1). Since *Klebsiella pneumonia* is still a formidable clinical problem, and analysis of the experience in a large general hospital was undertaken.

Material

During a ten-year period, 1955 to 1965, 11 patients were admitted to Hennepin County General Hospital with lobar pneumonia, from whom *Klebsiella pneumoniae* was the predominant organism recovered from the sputum.

TABLE 1. Mortality in *Klebsiella pneumonia*

Series	No. Cases	No. Deaths	Percent Mortality
1937 Solomon	32	31	97
1943 Hyde and Hyde	51	26	51
1954 Erasmus	17	0	0
1956 Hamburger and Jerve	15	8	53
1964 Lampe	45	10	21
1965 HCGH	11	6	54

* From the Department of Internal Medicine, Hennepin County General Hospital, and the University of Minnesota Medical School.

** Oakland Naval Hospital, Oakland, California.

† Instructor in Medicine, Hennepin County General Hospital, and the University of Minnesota; Director, Pulmonary Laboratory, St. Mary's Hospital.

TABLE 2. Treatment and Outcome of Eleven Cases of *Klebsiella pneumonia* Seen at Hennepin County General Hospital during the Period 1955-1965

Case No.	Age	Sex	Treatment	Outcome
1	50	M	Streptomycin, penicillin, chloromycetin, steroids	Died six hours after admission
2	44	M	Chloromycetin, tetracycline, steroids	Died eight hours after admission
3	67	M	Oxytetracycline, streptomycin	Died 36 hours after admission
4	60	M	Penicillin, chloromycetin	Died 24 hours after admission
5	76	M	Kanamycin	Died on 22nd hospital day
6	86	M	None (diagnosis made at necropsy)	Died 12 hours after admission
7	87	M	Streptomycin, chloromycetin	Discharged after 14 days in hospital
8	38	M	Penicillin, chloromycetin, streptomycin	Discharged after 21 days in hospital
9	42	F	Colistimethate, penicillin	Discharged after 32 days in hospital
10	65	M	Chloromycetin	Discharged after 37 days in hospital
11	48	M	Penicillin, methicillin, chloromycetin	Discharged after 65 days in hospital

Results

The treatment and course of our cases is summarized in Tables 2 and 3. The majority of our patients were between the ages of 41 to 50, the youngest being 37 years old. The overall mortality in our series was 54 percent. One (No. 6) was thought to have congestive heart failure rather than pneumonia and was not treated with antibiotics. In nine of our 11 patients, a history of severe alcoholism was obtained. In eight, the upper lobes were involved, the right more often than the left. Leukopenia was found in only three. Eight patients had hemoptysis. Although nine were alcoholics, in only three was aspiration thought to be an important factor in the production of pneumonia; and these three were not alcoholics.

Our series bears out the great severity of this illness as seen on admission, and the high early mortality of this disease. Of the six deaths, four died within 24 hours of hospitalization. Three had positive blood cultures for *Klebsiella* on admission of whom two died within 24 hours after admission. All patients were febrile on admission, and appeared toxic. Hypotensive shock was present on admission in eight of the 11 patients.

Seven had pneumococcal infection by sputum culture. Two cases had positive sputum cultures for tuberculosis reported at a later date. In one case, an atypical mycobacterium was cultured. Both had expired, and both had negative sputum smears for acid-fast bacilli on admission.

Case Report

This case is reported in detail to show the fulminating nature of *Klebsiella pneumonia*, and is fairly typical of our experience with this disease. G. P. was a 50-year-old white man, admitted to Hennepin County General Hospital on September 9, 1965, because of acute respiratory distress.

TABLE 3

Case No.	Location of Pneumonia	Temperature on Admission F°	WBC on Admission	Sputum Culture	Blood Culture
1	RUL	104	4,300	+	-
2	RUL	107(R)	5,600	++	++
3	RUL	102	2,050	+	-
4	RUL	104	1,200	+	+
5	LUL	101	15,700	++	-
6	LUL	101	12,600	+	-
7	RLL	101	6,800	+	-
8	LLL	102	10,000	+	+
9	LLL	101	10,600	+	-
10	RLL	103.4	7,200	+	-
11	RUL	101.5	53,200	+	-

He had been seen at this hospital in March, 1965, with symptoms of a mild upper respiratory infection. He was afebrile, and was treated as an outpatient. Chest x-ray film was read as normal.

He was next seen on September 9, 1965, when he had been ill approximately four days. He had been living in a railroad boxcar and drank more than one quart of liquor per day. During the three days before admission, he had no food and for 24 hours before admission, he had severe abdominal distress.

On admission, blood pressure was 86/70, in the supine position. He appeared toxic, dehydrated, had stertorous breathing, and a rectal temperature of 104°F. His sputum was bright red and tenacious. Examination of the chest showed an increased antero-posterior diameter, with equal expansion bilaterally. Tactile fremitus was decreased over the left chest. There were coarse inspiratory rales, dullness to percussion, and increased vocal fremitus in the same area anteriorly. The right lung was clear to percussion and auscultation. There was suprasternal retraction during inspiration. Heart rate was 150, with regular rhythm, and no murmur was noted.

Laboratory

Laboratory studies revealed the following: hemoglobin was 14.1 gram/100 ml and hematocrit 41 percent. The white blood count was 4,300 with 77 percent polymorphonuclears, and 23 percent lymphocytes. Urinalysis showed a specific gravity of 1.021 with 2 + albumin. The blood sugar was 64 mg/100 ml, serum amylase 34 units, and blood urea nitrogen 100 mg/100 ml. Sputum smear revealed many gram negative encapsulated rods typical of *Klebsiella*. There were also numerous gram positive diplococci in pairs. Sputum culture grew numerous colonies of *Klebsiella pneumoniae*, and a moderate number of colonies of pneumococci. No acid fast bacilli were seen on sputum smear; however, the sputum culture was later reported to show a type III, non-chromogenic atypical *Mycobacterium*. Electrocardiogram revealed a supraventricular tachycardia. The admission chest x-ray film showed complete consolidation of the left upper lobe, with some bulging of the fissure on the lateral projection.

Initially, small amounts of metaraminol (Aramine) were administered to maintain a normal blood pressure. Chloramphenicol, 2.0 grams, was given intravenously, and aqueous penicillin was also administered intravenously in an initial dosage of 1.2 million units. Plasma and one unit of whole blood was given. Prednisolone (Solumedrol), 120 mg was given intravenously, during the six hours after admission. It became more difficult to maintain an effective blood pressure, and the patient died six hours after admission to the hospital.

A necropsy was performed with the following findings: the left hemithorax contained 50 ml of blood. The left lung weighed 2,050 grams and the right lung weighed 650 grams. The left upper lobe was tense and distended and had the consistency of liver. The pleural surfaces were smooth and shiny. On cut section the left upper lobe was completely consolidated. A copious amount of thick, foul-smelling fluid could be expressed from the parenchyma.

The liver weighed 2,100 grams and showed fatty metamorphosis. The heart, coronary arteries, and gastrointestinal tract were normal. Both adrenal glands were symmetrically enlarged with punctate areas of hemorrhages in their center.

Comment

Klebsiella pneumoniae was first described by Friedlander in 1882. The pneumonia is typically an acute, fulminating disease, generally affecting debilitated

adults. There is a prevalence for the upper lobes, particularly the right upper lobe, and abscess formation is common. The exact incidence of this disease is somewhat difficult to determine, since many pneumonias are not studied bacteriologically. In hospitalized patients with pneumonia, *Klebsiella pneumoniae* is reported to be the etiologic agent in 0.25 percent to 4 percent of all pneumonias. The incidence of *Klebsiella pneumoniae* is less than 1 percent of all lobar pneumonias seen at this hospital.

Friedlander's pneumonia is generally seen in men, and the greatest incidence is in those over 40 years of age. Race and occupation do not appear to be important factors. There does seem to be an association with chronic illness, alcoholism, and debilitation. This has partly been attributed to the patient's inability, due to a debilitated state, to accomplish a leukocytic response. However, in our series, the prognosis was equally poor in those with leukocytosis as well as leukopenia.

The clinical features in Friedlander's pneumonia are variable. Usually the onset of a lobar pneumonia due to *Klebsiella* is associated with extreme toxicity. Hypotensive shock is often present. High fever and pleuritic pain are common. Leukopenia is reported to be frequent, and in an overwhelming pneumonia with leukopenia, one should suspect *Klebsiella*. In our series, however, only 27 percent had leukopenia (Table 3). Jaundice occurs in about 20 percent of cases. The sputum is usually brick red, tenacious, and mucoid.

Radiographically, Friedlander's pneumonia may resemble other lobar pneumonias. Characteristically, there is an increase in the volume of the involved lobe with bulging of the fissures. Unlike other pneumonias, the border of the infiltrate in Friedlander's pneumonia is usually sharp and distinct, quite dense, and is prone to early abscess formation. Because of abscess formation in an upper lobe pneumonia, radiographic differentiation from tuberculous and aspiration pneumonias may be difficult. Pleural thickening and fibrosis may be present.

Grossly, the lungs are heavy, the cut surface being mucoid and sticky. The surface is red, from which pus exudes as if under pressure. The involvement is usually lobar. Microscopically, necrosis of the alveolar wall is seen. This can lead to destruction of the lung parenchyma and early abscess formation.

Weiss and associates have reported that over 90 percent of *Klebsiella* are sensitive to streptomycin, chloramphenicol, or both. Yet, in spite of early treatment with appropriate antibiotics in bactericidal concentrations, the mortality remains high. The mor-

tality in published series varies between 0 percent to 97 percent (Table 1). In 1958, the American College of Chest Physicians established a committee to review the treatment of Friedlander's pneumonia. They recommended that treatment consist of a combination of streptomycin, 2 to 4 grams per day, and tetracycline, 4 grams per day. Others have recommended chloramphenicol in doses of 2 to 4 grams per day, instead of tetracycline. Using these combinations, most investigators feel therapy should be continued for a period of two weeks.

In our series of 11 patients, adequate dosages of streptomycin and chloramphenicol were used, yet our mortality of 54 percent remains high.

Recently, it has been demonstrated that *Klebsiella pneumoniae* is resistant to chloramphenicol and streptomycin in over 80 percent of some 30 strains tested. In 30 isolates of *Klebsiella pneumoniae*, Maiztegui and co-workers found that 67 percent were resistant to chloramphenicol, 83 percent to streptomycin, and 80 percent to tetracycline.

Petersdorf and Plarde have shown that the salts of colistimethate and polymixin B inhibit over 80 percent of *Klebsiella* at concentrations of 5 micrograms per milliliter. Colistin seems highly effective in eliminating *Klebsiella* from the urine, but is less impressive in deep seated pulmonary infections.

Maiztegui and colleagues have reported that all strains of *Klebsiella* are sensitive to Polymixin B, and that about 7 percent are resistant to kanamycin. Turck and associates have demonstrated that cephalothin in a concentration of 10 $\mu\text{g}/\text{ml}$ will inhibit 60 percent of some 100 strains of *Klebsiella*. Ampicillin, on the other hand, given parenterally in doses from 1 to 8 grams per day, was found not to be effective in patients with *Klebsiella* infections.

High doses of steroids have been shown to have some benefit in the treatment of gram negative bacteremic shock. Melby and Spink have reported that patients who have bacteremia without shock,

have a mortality rate of about 20 percent. When shock is present, the mortality increases to 80 percent. Sixty-two percent of our series were clinically in shock at the time of admission. Although it has been shown that subclinical adrenal cortical insufficiency does not seem to be present in gram negative septicemia, there is evidence that administered corticosteroids suppress the systemic reaction to endotoxin, and may potentiate pressor agents. Treatment for shock, if present, should be vigorous.

Summary

An analysis of 11 cases of Friedlander's pneumonia has been presented, and the clinical features and their relation to the radiographic and pathologic findings have been discussed. In our cases, alcoholism and debilitation appeared to be factors in the disease process. There was a high, early mortality and pneumococcal infection was often associated. The upper lobes were generally involved, the right more commonly involved than the left. Leukopenia was found in only three of the 11 cases. Our patients were treated with parenteral streptomycin and chloramphenicol. With this therapy, our over-all mortality was 54 percent, with most deaths occurring within the first 24 hours after admission. Recent reports from the literature indicate that other antibiotics, especially polymixin B, kanamycin, and colistimethate may be more effective in treating *Klebsiella pneumoniae*, due to its changing sensitivity pattern. Cephalothin also shows some promise in the treatment of this disease. Evidence showing that many strains of *Klebsiella* may be resistant to streptomycin and chloramphenicol is presented. In hopes of reducing the mortality of this disease, it seems reasonable to use kanamycin, colistimethate, cephalothin or polymixin B, as a first choice antibiotic until sensitivities are available.

(The figures and references may be seen in the original article.)

LYCOPERDONOSIS*

Roy D. Strand, MD,† Edward B. D. Neuhauser, MD,‡ and Charles F. Sornberger, MD,§ Boston, New Eng J Med 277(2):88-89, July 13, 1967.

For 'tis the sport to have the enginer

Hoist with his own petar. . . (Hamlet.III:4:207).

Lycoperdonosis is the respiratory disease caused by inhalation of large quantities of spores from the mature mushroom, commonly termed puffball.

Lycoperdon is the genus of fungi to which most puffballs belong. The two most common species, *Lycoperdon pyriforme* and *L. gemmatum*, have world-wide distribution. They may be found from July to October, often growing on decaying logs, stumps and woody refuse, generally in dense clusters, and may occasionally be scattered through open fields. *L. gemmatum* can form mycorrhizae with seedlings of northern white pine and Norway spruce. The spore fruits of lycoperdon are pear or top shaped, with large, sterile bases. Within the wall, or peridium, of the puffball, vast numbers of club-shaped spores form. At maturity, any external agitation or compression of the peridium cause the spores to be discharged through apical ostia. A single lycoperdon produces approximately 1.6×10^{14} spores.

The word lycoperdon is a learned back-formation to a nonexistent Greek term that would mean "wolf flatus." Lykos is the Greek equivalent of wolf. Lycoperdon and Shakespeare's petar are etymologically linked with the French verb *pet*, to expel intestinal gas. In the beginning, the petar was an enormous *pet*, or sometimes a mortar, and he who is "Hoist with his own petar" is the victim of a peculiarly personal rocket action, such as Hieronymus Bosch actually depicted in his *Last Judgment*. The metaphor of the silent flatus appears to have attached itself to the puffball in earliest times, before the dispersion of the Indo-European peoples. Early in the study of mushrooms, Gerard called them "earthy excrescences." Now it is known that these "earthy excrescences," when burst (or "hoist"), in a specific fashion, may have pulmonary manifestations.

It is well known to Coon and Dodge and to many

nonherbalists that some practitioners of folk medicine use the hemostatic effect of the "dust" that can be extruded from puffballs. The concept has been applied to surface wounds and nosebleeds. For the treatment of epistaxis, the usual technic is to hold the puffball under the nose and inhale gently as the spores are puffed, so that the spores adhere to the inside of the nostril.

With a massive inhalation of the spores, symptoms become rapidly progressive. Nasopharyngitis occurs within a few hours of exposure, and a form of pneumonitis appears, accompanied by nausea, a rapid pulse, crepitant rales and dyspnea. The course may be protracted for many weeks, with gradual subsidence of symptoms to complete recovery. Two cases are presented below.

Case Reports

Case 1. G. R., a 14-year-old boy, experienced a spontaneous nosebleed while preparing for school in Cortland, New York. Cold packs and pressure were ineffective. The puffball remedy was known to the family, and since a spore fruit of about 1½ inches diameter was available, the patient inhaled a portion of a thick cloud of spores. He repeated 2 deep nasal inhalations, followed by a forceful oral inhalation, and then walked to school. By midmorning he appeared to have a cold and fever and was sent home. That evening he was nauseated and vomited several times. The temperature reached 103°F., and mild epistaxes continued.

On the following morning he was first examined by the family doctor. His complaints were of nasal congestion, continued nosebleed, nausea and difficulty in breathing. On examination the mucous membrane of the nose was swollen and bathed in a layer of blood. The lungs were clear to percussion and auscultation, but the patient was dyspneic.

The temperature was 102°F., the pulse 120, and the respirations 30.

On the next day the nausea subsided, but the other symptoms continued. On the 3d day, showers of fine, crepitant rales appeared at both lung bases, unaccompanied by bronchial breathing or dullness. A course of sulfadiazine and forced fluids was started. The febrile reaction gradually increased, and the crepitant rales became generalized. On the 7th day

* From the Department of Radiology, Children's Hospital Medical Center (requests for reprints should be addressed to Dr. Neuhauser in the Children's Hospital Medical Center Department of Radiology, 300 Longwood Avenue, Boston, Massachusetts 02115).

† Philip H. Cooke Fellow in Radiology, Children's Hospital Medical Center.

‡ Chief of radiology, Children's Hospital Medical Center; clinical professor of radiology, Harvard Medical School.

§ Radiologist-in-chief, Day-Kimball Hospital, Putnam, Connecticut.

"Reproduced with permission of *The New England Journal of Medicine*."

the sulfadiazine was stopped, and he was admitted to the hospital.

The temperature was 100.2°F., the pulse 120, and the respirations 30.

The white-cell count was 16,000, with a normal differential. The sputum was negative for acid-fast organisms, but showed an unidentified type of spore formation. (The history of inhalation of puffball spores was not known at this time.) A film of the chest showed both lungs to be studded throughout with fine, miliary nodules, more prominent centrally, where there was some confluence. A course of penicillin, 30,000 units every 3 hours, was begun.

The febrile course continued; the patient appeared ill and continued to feel poorly. The slightest exertion caused respiratory difficulty. The penicillin was discontinued after 2 weeks. Serial x-ray films showed little change in the appearance of the lungs. After 1 month in the hospital he was discharged, slightly improved. The fever slowly subsided to normal after about 3 weeks. The rales disappeared, and the general condition was considerably improved. A few spores were still present in the sputum. By this time the history of inhalation was known, and the spores compared accurately with a sample from the puffball used earlier.

The patient was not allowed to return to school until the following term. He was lost to follow-up observation for 9 years, when he was referred to one of us (C.F.S.) for x-ray examination of an injured ankle. A film of the chest was normal and he had no respiratory complaints.

Case 2. J. M., an 8-year-old girl, was admitted to the hospital with the history of a spasmodic cough, slight dyspnea and occasional sweats, all of 3 months' duration. The past history revealed a single item of interest. She had had frequent nosebleeds, for which her mother had her inhale large quantities of powder from dry puffballs. She had always lived in and about Pittsfield, Massachusetts, except for an admission to the Massachusetts General Hospital for the removal of a congenital cataract.

Physical examination of the chest and a patch test for tuberculosis were negative. X-ray study revealed an abnormal pattern, which included a fine nodular infiltration through both lungs from the apexes to the bases. There was confluence of these small nodules toward the hili. She gradually recovered without specific treatment and was lost to follow-up study for 9 years. When she started nurse's training,

a film of the chest was normal, except for extremely fine noncalcified nodules still scattered through both lungs. The central confluence was no longer apparent, as the hili were not prominent. Current communication with the patient indicates that she is in good health, without a pulmonary complaint.

The 2 cases present similar, early symptomatic manifestations, identical x-ray patterns in the acute phase and equally benign final courses. The early symptoms and x-ray signs of fine pulmonary nodularity forces one to consider miliary tuberculosis or a form of histiocytosis. The increased density about the hili suggests some bizarre cause for pulmonary edema. In the late phase, the differential diagnosis would include arrested granulomatous disease and pneumoconiosis. The spores probably act, in aggregates, as a foreign body rather than setting up an infection. *Lycoperdon* spores are notoriously difficult to germinate in the laboratory, and Dodge doubts whether they would germinate and produce mycelium in the lungs. It is curious that more cases do not appear. The proper technic of applying the spores only to the nasal mucosa, leaving the lungs immaculate, must rarely be accomplished. Though this cure for nosebleeds may be somewhat efficacious, since the spores form a matrix for the clot, the degree of use is not known. Subclinical cases may be common.

Summary and Conclusions

Two cases of pulmonary *lycoperdonosis* are presented as prototypes of the disease. The cause is the excessive inhalation of puffball spores associated with the folk-medicine treatment of epistaxis. The pulmonary involvement is regarded as reactive rather than infectious. The similar histories, symptoms and x-ray patterns are stressed.

In the interest of preventive medicine it is suggested that puffballs be gathered while young and, thinly sliced, sautéed in butter with a touch of garlic and a pinch of thyme. They are delicious prepared in this fashion.

We are indebted to Dr. P. William Haake, deceased, who was most responsible for identifying the cause of the symptoms of Case 1, to Dr. F. F. Sornberger, who was the radiologist involved in Case 2, and to Dr. John F. Gowdey, who provided us with the x-ray films and history on Case 2.

(The figures and references may be seen in the original article.)

MEDICAL ABSTRACTS

RESUSCITATION AND MANAGEMENT OF SHOCK ON THE BATTLEFIELD

LCDR Charles E. Dowell, MC USNR,
Camp Pendleton Symposium on
Combat Surgery, Mar 1968.

Introduction and Background

Perhaps in no other situation than that which we encountered in Vietnam could the early diagnosis of the *type of shock* be more easily made. It was quite clear to us that the basic underlying pathology causing a breakdown in the cardiovascular system, was due to hemorrhage and trauma—resulting in “circulatory shock.” Hemorrhagic and traumatic shock can be considered collectively as hypovolemic shock. Such a shock state is due not only to a loss of intravascular integrity but equally to a loss of extravascular extracellular fluid. If one procrastinates long enough such sequelae as poor tissue perfusion, development of oxygen debt with a metabolic acidosis resulting from anaerobic metabolism and, finally diminution of cardiac output will result.

It is well known that by the time clinical evidence of shock occurs, the patient has suffered a great loss of his blood volume (one fourth to one third) according to Eiseman and Carnes. By this time, many of the compensatory mechanisms are in full operation and probably beginning to fail altogether.

As the blood volume decreases to a significant degree, there are a number of signs and symptoms which occur indicating this loss, namely:

1. Pale, cool, moist (clammy) skin
2. Oliguria
3. Tachycardia
4. Weakness and fatigue
5. Restlessness

It is with this background in mind and the understanding of the basic problems with which we were confronted that shock and resuscitative teams were organized at our hospital. Each team consisted of a minimum of five persons:

1. Medical Officer—in charge of the airway problem
2. Medical Officer—in charge of the circulatory and homeostatic problem
3. Corpsman—assisting with the circulatory and homeostatic problem
4. Corpsman—making available necessary supplies for the resuscitation

5. Corpsman—keeping a succinct record of all work done on the patient

Treatment

I. *Control of Bleeding*—Accomplished by the application of compresses, tourniquets, or the direct application of clamps, etc.

II. *Maintenance of Airway*—This required the insertion of a nasal catheter, an endotracheal tube, the performance of a tracheostomy or the application of a face mask. Oxygen was delivered by one of these routes at a rate of 5 liters per minute.

III. *Venipuncture*—Venipunctures were made using large bore catheters—14, 15, 13 gauge—and many times surgical cutdowns were necessary utilizing either the antecubital, femoral, or saphenous veins. A minimum of two such catheters were inserted, and often as many as four.

IV. *Fluid Therapy*—The predominant fluid used at our hospital was Lactated Ringer's in 5% Dextrose and Water. Other ancillary fluids used were Human Serum Albumin or Plasmanate (5% protein fraction) in preparation for subsequent whole blood transfusion.

V. *Whole Blood*—A great number of the patients we resuscitated required massive blood transfusions (ten or more units) and this was administered according to the criteria of Howland et al.

VI. Parameters Used for Monitoring the Patient

1. Central Venous Pressure
2. Peripheral Blood Pressure
3. Pulse Rate
4. Urinary Output
5. Capillary Refilling

VII. *Ancillary Drugs*—Narcotics were given intravenously to allay any pain that the patient might be experiencing. Only the amount necessary to allay pain was given. Standard dosages were 0.1 mg per kg for morphine and 0.5 mg per kg for demerol. These were repeated every 15 minutes or as necessary to provide the proper sedation.

Mannitol utilizing a 20% solution was given to maintain good diuresis whenever the urinary output was low.

Disposition of Patients

Only those patients having a life threatening injury were operated on at our hospital, the remainder were sent to other *in country hospitals* or to the Hospital Ship (USS Repose) for definitive surgery.

CHANGING CONCEPTS IN THE EPIDEMIOLOGY OF VIRAL HEPATITIS

R. S. Koff, MD, and K. J. Isselbacher, MD,
New Eng J Med 278(25):1371-1380
June 20, 1968.

During the past decade advances in virology and vaccine development have resulted in a striking decline in the incidence of a number of common viral diseases. Whereas viral hepatitis has attracted increasing attention as a public-health problem, progress in hepatitis virology has been exceedingly slow. At present the etiologic agent of viral hepatitis has not been identified, and no vaccine is available for prevention of the disease. On the basis of the past experience with poliomyelitis and measles vaccines, it is likely that even after isolation of the hepatitis virus or viruses, five to 10 years will probably elapse before a hepatitis vaccine becomes commercially available. Thus, prevention of viral hepatitis, based on a sound knowledge of the epidemiology of the disease, continues to be a major public-health goal. Over the past few years a number of studies have led to important conceptual changes in the epidemiology of viral hepatitis. The present report is an attempt to review some of the major recent advances in the epidemiology of this disease.

IDENTIFYING THE TUBERCULOUS INFECTED

C. E. Palmer, MD, and L. B. Edwards, MD,
JAMA 205(3):167-169, July 15, 1968.

While the tuberculin test has long been a most useful tool for identifying the tuberculous infected in a population, it has the limitation that it may elicit cross-reactions in persons infected with other (nontuberculous) mycobacteria. One approach toward improving the identification of persons with tuberculous infection, is a dual-test technique, using an atypical mycobacterial antigen together with tuberculin. In 1958, the Public Health Service and the US Navy instituted a cooperative program

designed to study skin-test sensitivity and related tuberculosis morbidity among navy recruits. Preliminary results from this program provide striking evidence that the use of another mycobacterial purified protein derivative (PPD) in addition to tuberculin significantly improves the identification of the tuberculous infected in a population.

EPIDEMIOLOGIC STUDY OF *CRYPTOCOCCUS NEOFORMANS*

W. M. Newberry, Jr., MD, et al., *Ann Intern Med* 67(4):724-732, Oct 1967.

An epidemiological study of cryptococcosis was conducted among a group of pigeon fanciers and a group of individuals having no contact with pigeons. A careful history was taken, a chest X-ray was made, intradermal tests were applied, and a serum sample for serologic tests was obtained from each person in the study group. Twenty-five of the 28 persons in close contact with pigeons were exposed to *Cryptococcus neoformans* present in their pigeon coops. Nine of the 28 persons (32%) had positive cryptococcin intradermal tests, but none had any clinical evidence of active cryptococcosis, and their serologic tests for *C. neoformans* were all negative. Only 1 of 24 individuals (4%) having no contact with pigeons had a positive cryptococcin intradermal test. Serologic tests for *C. neoformans* were also negative in this group.

The greater prevalence of reactions to cryptococcin among the group with known exposure to *C. neoformans* is statistically significant. Absence of positive findings from medical histories and physical examinations suggest that these infections of cryptococcosis were mild or asymptomatic. The number of infections detected in this group is less than would be seen if the group were similarly exposed to other of the systemic mycoses, such as *Histoplasma capsulatum*. This may be attributed to lack of sensitivity of the cryptococcin antigen at a 1:100 dilution and to the size of the organism *C. neoformans*. These results of the cryptococcin skin test antigen merit further evaluation of this antigen as an epidemiologic tool.

DENTAL SECTION

THE ROLE OF MINOR ORTHODONTICS

CDR Albert R. Smith, DC USN.

The fact that minor tooth movement can play an important role in both the prevention and treatment of periodontal patients is well established in the literature.

Dr. John O. McCall said, "I think periodontal treatment as well as prevention belongs in general practice, with suitable exceptions made for the very complex cases. I have the same belief about orthodontics, so often an essential factor in prevention of periodontal disease."

The early diagnosis and correction of dental problems which may lead to the ultimate loss of a tooth or teeth is of cardinal importance. Therefore, an important role of the dentist is the correction of factors and conditions which will probably lead to periodontitis. Listed here are some of the principle reasons for moving teeth.

1. Teeth that need to be placed in a more healthy anatomical position for the protection of the periodontium.

2. Correction of tooth position to improve the function of the dentition. This lends itself not only to occlusal harmony, but also a healthier temporomandibular joint.

3. The closure of an existing space where a tooth is missing and by so doing, eliminate the need for a prosthetic replacement.

4. Enlarging a space for the prosthodontist or improving the alignment of abutment teeth.

5. Returning teeth that have drifted or fanned out due to periodontitis and/or tongue thrust habits: This will obtain a more normal tooth to bone relationship by eliminating much of the infra-bony pocket.

6. Esthetics-almost always the esthetics of a case are improved whenever the various corrections mentioned above happen to take place in the anterior or near anterior regions of the mouth. The importance of esthetics and the resulting attitude of the patient toward his natural dentition should not be overlooked.

A type of removable appliance such as the Hawley or modified Hawley is the appliance of choice. It supplies anchorage so greatly needed, as well as permits the patient complete access to his teeth for good oral hygiene. Also, many adults have jobs

which require them to remove, at times, their orthodontic appliances for various reasons, i.e. briefing their boss, making a speech, etc. This they can do with a removable type of orthodontic appliance.

The possibility of root resorption occurring during tooth movement should not be viewed out of perspective. To some, orthodontics and root resorption are almost synonymous terms. However, root resorption, when it does occur, usually happens in orthodontic cases requiring several years to complete.

Teeth may be safely moved without regard to age. The same care and good clinical judgment should be exercised in orthodontics as would be in any other dental treatment.

Lastly, the problem of retention should be viewed as an integral part of the treatment plan before any treatment is carried out. Retention with an orthodontic retainer for a period of time may or may not be needed, but teeth which have received supporting structure damage often need a permanent type of splint such as pin ledge or fixed partial denture. Also, a wire reinforced acrylic splint running between proximal cavity preparations works well when cast type splints are not available.

(Abstract of report submitted during Postdoctoral Fellowship.)

MEDIASTINAL EMPHYSEMA PRODUCED BY AIR TURBINE DENTAL DRILLS

*R. B. Hunt and O. D. Sahler, JAMA
205:241-242, July 22, 1968.*

Two cases are reported in which mediastinal emphysema occurred after the use of high-speed air turbine handpieces during oral surgical procedures and initially was incorrectly attributed to anaphylactoid reaction to the local anesthetic. Mediastinal emphysema is a serious clinical entity with potential, and occasionally lethal, complications. The first case involved a healthy 38-year-old man. A fragment was broken from a mandibular molar during extraction and a high-speed air turbine dental drill operated with a water spray was used to score the retained fragment. "Within five seconds" the patient felt his right cheek swell. The procedure was discontinued and a physician was summoned, who diagnosed an anaphylactoid reaction and gave epinephrine by intramuscular injection. Since no further untoward reactions developed, the dentist

The opinions and assertions contained herein are those of the author and are not to be construed as reflecting the views of the Navy Department or the naval service at large.

continued. Again "within seconds," the patient's right eye swelled shut and his throat felt tight. He had no other symptoms. The patient was referred to a hospital emergency room. Roentgenograms revealed emphysema of the soft tissues of the head, neck, and mediastinum. The second case was that of a 12-year-old boy who developed similar symptoms immediately after an air turbine dental drill was used in tooth extraction. In the first case, the air turbine developed 25 to 32 p.s.i. of air pressure in the central box. Although most air escapes from the mouth, a water spray carries some air toward the drill point. In these cases, emphysema developed because air was forced between the gingival tissue and the alveolar bone; either through the tooth socket or along the retracted gingival crevice. Both patients made uneventful recoveries. The report discusses mediastinal emphysema, and mentions a fatal air embolism reported to have occurred after compressed air was used in root canal therapy. Dentists should keep in mind the fact that the air turbine dental drill may be responsible for both mediastinal emphysema and air embolism.

(Abstracted by: CAPT Nelson W. Rupp, DC USN.)

THE EFFECT OF HYPERBARIC PRESSURE ON THE MARGINAL LEAKAGE OF AMALGAM RESTORATIONS

*LCDR George A. Biron, DC USN, and
LCDR Paul P. Hatrel, DC USN.*

In underseas explorations, man is subjected to extremely high pressure. The effect on teeth and dental restorative materials is not known. This study was made to determine the effect of increased pressure on marginal leakage of amalgam restorations. Freshly extracted human molars, free from any visible defects, were kept in water at room tempera-

The opinions and assertions contained herein are those of the authors and are not to be construed as reflecting the views of the Navy Department or the naval service at large.

ture until used. Standard Class V amalgam restorations, with no cavity liners or bases, were placed on both the facial and lingual surfaces. All cavo-surface margins were kept within enamel. Roots and occlusal surfaces were sealed with sticky wax. Specimens were placed on 25 ml. of 0.025% crystal violet dissolved in either water or saliva and then pressurized to 4 and 7 times atmospheric pressure (44.1 and 88.2 pounds per square inch gauge) for periods of 30 minutes, 24 hours, or 7 days. Controls were kept at atmospheric pressure. After removal from the chamber and the dye solutions, specimens were rinsed, dried, and cut in half with a dry diamond saw. Margins were then examined for penetration of the dye. It was found that leakage around the amalgam restorations was a function both of pressure and time, with leakage occurring more rapidly at the higher pressure. Saliva penetrated more slowly than water, indicating that viscosity was also a factor. It was concluded that increased pressure increases marginal leakage, but that the amount of penetration was limited by viscosity of the oral fluids and time of exposure.

(Abstract by Research Work Unit: MR005.19-6052 by LCDR G. E. Biron, DC USN, and LCDR P. P. Hatrel, DC USN.)

FAR EAST CHAPTER ASSOCIATION OF MILITARY SURGEONS OF THE U.S.

The Far East Chapter, Association of Military Surgeons of the United States, will hold their second annual meeting from 31 October through 2 November 1968. Participants will include the tri-service medical establishment in the Pacific area and the Far East. The program has been divided into five section headings—Medical, Dental, Veterinary, Nursing, Administrative and Allied Sciences. The theme of the meeting is "Team Concepts in Medical Care." The Navy will host the meeting which will be held in Yokosuka, Japan.

NURSE CORPS SECTION

MAN YOUR PATIENT HANDLING STATIONS

LT Lorraine Conway, NC USN.

The following was presented at a symposium "Nursing Ashore and Afloat" sponsored by the Nurse Corps officers, Naval Hospital, Key West, Florida in commemorating the 60th anniversary of the Nurse Corps.

LT Lorraine Conway, presently on the staff at Key West, was stationed on the USS SANCTUARY (AH-17) from 22 February 1967 to 30 March 1968.

One year ago, when this announcement was heard, all made haste to their assigned areas to prepare the way for "mock casualties." Rehearsals of this nature were held daily until all existing problems could be refined. But, on April 10, 1967, the rehearsals were discontinued, and the stage was set for the appearance of men who were injured in the conflict which presently exists in Vietnam.

The procedure was known by all on the USS SANCTUARY as Triage. Webster has defined Triage as the sorting out and classification of casualties to determine priority of need, and the proper place of treatment. The principle of Triage was developed in time of war, and probably reached its peak in World War One. At that time, patients were divided into three major divisions. The first division consisted of those whose wounds were minor. The second included major injuries which require life saving measures with an excellent chance of recovery. The third division consisted of patients whose injuries were considered hopeless, and they were treated last. Today, Triage has been redefined as the evaluation and classification of casualties for purposes of treatment and evacuation. The Triage Surgeon has been given the responsibility of exercising sound surgical judgment in determining which patients require immediate resuscitation, which are in shock, which will require major surgery and the urgency of that surgery, and which will require minor surgery that can be performed in the clinics and treatment rooms.

The Triage area on the USS SANCTUARY was a room located at the stern of the ship in close proximity to the helicopter deck. The room was of average size with stretchers set up at all times. There were oxygen outlets beside each stretcher and suction within easy reach. Intravenous solutions of Ringer's Lactate were located above each stretcher ready for immediate service. A pegboard on the

bulkhead contained oxygen and suction catheters, angio- and intra-catheters, chest tubes and spinal tubing, and other necessary materials for dressing wounds which were distinctly marked for clarity. Two emergency drug boxes were placed on each side of the room, and were opened prior to the arrival of patients. The room also contained an electrocardiogram machine with all necessary accessories. A large plexi-glass board was located on the bulkhead listing the various wards and the number of available upper and lower bunks on each ward. The board was marked as the assignment of patients to a ward was made by the Surgeon. In the near future, a new type of stretcher will be used consisting of a metal frame covered with a translucent type of material. The frame can be removed from the base of the stretcher, and then placed on the X-ray table or a bunk to eliminate the frequent moves of the patient to different stretchers between the "helo" deck and his final destination on the ward.

Once "Patient Handling" was announced, the staff "turned to" and each department made ready to care for all oncoming casualties. The Operating Room, Recovery Room, Radiology, and Laboratory were instantly manned; the litter bearers waited just outside Triage. Simultaneously, the ship's crew was prepared as their task was vital for the proper landing of a helicopter on the ship. Members of the ship's crew manned the helicopter deck twenty-four hours a day and tended to this area so that it was in a constant state of readiness. These men were trained by experienced officers, and each man was proficient in the performance of his duties. The "crash crew" was always prepared for an accident, a situation which must be anticipated. One seaman, dressed in an asbestos suit, waved all helicopters in, while another, with earphones, was in constant contact with the pilot during his approach. The Officer of the Day had to maneuver the ship so that it was in proper alignment with the current of air at that time. A green flag could be seen flying from the staff, while a light flashed day and night, to make known to all that we were always prepared to accept patients. As the helicopter approached, the pilot viewed not only a ready deck but also a large sign with bright red letters proclaiming "YOU

FIND 'EM, WE BIND 'EM; OPEN 24 HOURS." Preparations now were completed, and the crew waited for the pilot to accomplish his mission of transporting the injured men from the battlefields of Vietnam.

When the helicopter alighted on the deck, litter bearers, under the direction of a senior corpsman, approached the helicopter to transport patients. As they prepared to take the patient down the canopy covered ramp, the Ordinance Officer quickly examined the patient for the presence of ammunition because many of the men had grenades and guns hidden about their person in the event of emergency. The patient was brought directly to the Triage area, and transferred to a stretcher. Occasionally the ship's radio operator was informed by the pilot, prior to landing, of the number of patients aboard the helicopter and the seriousness of their conditions. In this event, the particular specialist required was given advance notice, and was present in the Triage area when the patient arrived.

Once in Triage, the patient was surrounded by a number of personnel working together in an orderly fashion to administer resuscitation and necessary treatment as quickly as possible. The surgeon examined all of the patient's wounds as to position and severity. With specialists in every field of medicine available on the ship, when a particular specialist was needed, he was immediately called to report to Triage. At times, the Orthopedist, Urologist, Neurosurgeon, and Ophthalmologist were all needed in the treatment of one casualty.

Cutdowns were started when indicated, and patients were simultaneously typed and crossmatched for blood. The demand on the Blood Bank was great, last spring, when the census of the hospital was rapidly rising with the admissions of seriously injured men. Many of the patients were received in a state of shock, and the rapid, efficient transfusion of blood was a necessity. Since the administration of fresh blood was one of the most effective means of reversing shock, the Pathologists and technicians were constantly at work endeavoring to provide the hospital with a constant supply of whole fresh blood.

While the patient was receiving emergency care, another person was acquiring specific information regarding the personal history of the patient. This task provided the essential information needed to contact his family, and provided the patient with the knowledge that the staff was interested in him as an individual.

All patients were assigned a ward by the surgeon in charge, and then sent directly to the Radiology

Department where, in many cases, X-rays of the entire body were taken. If the patient did not require surgery, he was sent to the Intensive Care Unit or a specific ward. The stretcher bearers, assigned to that patient, remained with him until he was safely conveyed to the ward.

If the patient required immediate surgery, he was taken from X-ray to the receiving area in the Recovery Room. Here, the Anesthesiologist and the recovery staff assumed the treatment of the patient, and also prepared him for surgery. Since the Operating Room staff were notified by a Triage member regarding the status of the patients, preparations of the Operating Room were begun while the patient was in X-ray. There were frequent occasions last spring when all Operating Rooms, clinics, and treatment rooms throughout the hospital were simultaneously used around the clock. Immediate debridement of open wounds was required because of the extensive tissue damage caused by high velocity missiles. These fragment wounds were highly infectious, and immediate treatment was needed to preserve the structure from further damage.

The role of the nurse in "Patient Handling" was of prime importance. The Triage nurse was responsible for many areas including assisting the surgeon in the resuscitation and emergency care of each patient, seeing that all orders of the surgeon were carried out, and seeing that each stretcher bearer was fully aware of the condition of the patient assigned to him. She notified the Radiology Department and the Recovery Room of the condition of the patient so that they were properly equipped and conscious of the emergency situations which could arise. She also assisted the surgeon in the treatment of the patient, and the Anesthesiologist in the preparation of the patient for surgery. The nurse in the Operating Room was responsible for seeing that the room was fully prepared for a particular type of surgery, and assisted during surgery to see that all necessary equipment was readily available. The nurse on the ward had to be assured that her area was in complete readiness for the admission of any number of patients, and that all patients were given the necessary nursing care as well as medical treatment upon arrival. She also had to be prepared for any emergency situations which could arise in this type of nursing.

Once the patient had received immediate treatment and was convalescing on his respective ward, the Medivac Program was placed in operation. The

policy was to send all patients who would not be ready for full duty within a thirty day period to an overseas or stateside hospital. If it was considered that the patient would not be ready for full duty within three months, he was sent to a stateside hospital near his home. Those patients who would be fully recovered within three months were transferred to a military hospital within the Pacific area until their convalescent period had terminated.

In addition to treating U.S. Military Forces, many men, women, and children of Asian background were treated. These people were sent to the ship via shore facilities which had been organized in support of the People to People Program in Vietnam. Some of these people had been injured as a

result of hostile action, and were flown to the ship for emergency treatment. Others were sent for consultation, and, frequently, were admitted for examination and subsequent surgery. The Vietnamese Interpreter, assigned to this duty by the South Vietnamese Liaison Officer of the Third Marine Amphibious Force in DaNang, was always available for translation and his presence in Triage proved to be of valuable assistance.

The Triage Program, presently in effect, provided an efficient method of giving immediate care to the seriously injured as well as subsequent treatment to the less seriously injured. The system has proved itself to be an effective one in the management of battle casualties.

RESEARCH SECTION

LIST OF RECENT PUBLICATIONS FROM RESEARCH LABORATORIES

Naval Air Development Center:

"A Method for Digital Calculation of Absolute Free Radical Concentrations," by Freeman W. Cope. AMRD Report: NADC-MR-6802, May 21, 1968.

"Relationships Among Assumptions of the Method of Limits and the Method of Constant Stimuli," by Robert M. Herrick. NADC Report: NADC-MR-6801, May 22, 1968.

Naval Aerospace Medical Institute:

"Acute Alcohol Ataxia in Persons with Less of Labyrinthine Function," by A. R. Fregly and Ashton Graybiel. *Acta Otolaryng*, Stockholm, Vol. 65, 1968.

"Cross-Validation of a Brief Vestibular Disorientation Test Administered by a Variety of Personnel," by Rosalie Ambler and Fred Guedry. *Aerospace Medicine* 39(6), June 1968.

"Optimal Weighting of Course Grades for Two Naval Air Training Schools," by Richard F. Booth. NAMI Report: NAMI-1039, May 3, 1968.

"Predicting Training Success in Non-Pilot Aviation Specialties," by R. F. Booth, F. E. Peterson, N. E. Lane, and R. Ambler. *Aerospace Medicine* 39(5), May 1968.

"Prevention of Overt Motion Sickness by Incremental Exposure to Otherwise Highly Stressful

Coriolis Accelerations," by A. Graybiel, R. Deane, and J. Colehour. Joint Report with NASA. NAMI Report No. 1044, June 1968.

"Vertebral Fracture in Jet Aircraft Accidents: A Statistical Analysis for the Period 1959 through 1963, U.S. Navy," by C. L. Ewing. *Aerospace Medicine* 37(5), May 1966.

Naval Medical Research Unit No. 3:

"Acute Endrin Poisoning," by Y. Coble, P. Hildebrandt, J. Davis, F. O. Raasch, and A. Curley. *Journal of the American Medical Association* 202, Nov 6, 1967.

Naval Biological Laboratory:

"Valley Fever: A Review of Navy Sponsored Studies on an Experimental Vaccine for Coccidioidomycosis," by Hillel Levine. ONR-BUMED project conducted at the University of California, NBL, Oakland, California, June 27, 1968.

Naval Medical Field Research Laboratory:

"Physical Fitness Test Standards for Women Marines," by Ann Jewett. NMFRL Report: Vol. XVIII, No. 6, June 1968.

Naval Medical Neuropsychiatric Research Unit:

"17-Hydroxycorticosteroid and Vanillylmandelic Acid Excretion in a Rapidly Cycling Manic-Depressive," by R. Rubin, W. Young, and B. Clark. *Psychosomatic Medicine* XXX(2), March-April 1968.

"On Typologies Which Maximize Therapeutic Validity," by Ardie Lubin. NMNPRU Report No. 66-5. Reprinted from *The Role and Methodology of Classification in Psychiatry and Psychopathology* by the HEW Public Health Service.

Naval Medical Research Institute:

"Axon Behavior and the Structure of its Membrane," by D. E. Goldman. *Bunsengesellschaft für physikalische Chemie*, Band 71, Heft 8, 1967.

"Comparative Metabolism of Rickettsiae and Other Host Dependent Bacteria," by Emilio Weiss. NMRI: MR005.09-0007 Report No. 26.

"Development of Interpersonal Relationships: Social Penetration Processes," by Dalmas A. Taylor. *Journal of Social Psychology* 75, 1968.

"*Halposporidium Simulii* Sp.N. (Haplosporida: Haplosporidiidae), Parasitic in Larvae of *Simulium Venustum* Say," by Richard Beaudoin and William Wills. *Journal of Invertebrate Pathology* 10(2), March-April 1968.

"A Review of Tissue and Organ Viability Assay," by Theodore Malinin and Vernon Perry. *Cryobiology* 4(3), 1967.

"Toxicity of Dimethyl Sulfoxide on HeLa Cells," by T. I. Malinin and V. P. Perry. *Cryobiology* 4(2), 1967.

"United States Navy Skin Bank," by William Trier and Kenneth Sell. *Plastic & Reconstructive Surgery* 41(6), June 1968.

"Viability Assay of Organized Tissues and Organs," by Kenneth W. Sell. *Cryobiology* 4(3), 1967.

Naval Submarine Medical Center:

"Breathing of Pressure Oxygenated Fluids by Submerged Mammals: A Literature Review," by P. L. Hendricks. SMRL Report No. 518, March 25, 1968.

"Carbonic Anhydrase Activity of Erythrocyte Ghosts," by Donald V. Tappan. NSMC Memorandum Report No. 68-7, April 11, 1968.

"The Feasibility of Using Pulsed Ultrasound to Detect the Presence of In Vivo Tissue Gas Bubbles," by John H. Sutphen. SMRL Report No. 508.

AEROSPACE MEDICINE SECTION

POTENTIAL OF THE HELICOPTER FOR CIVILIAN MEDIVAC

The following has been excerpted from the text of an address given by CDR Philip A. Hogue, USCG, at recent graduation ceremonies for Aerospace Medicine Technicians at the Naval Aerospace Medical Institute. There has been much recent interest in applying the experience and resources gained through medical evacuation and treatment techniques developed in Southeast Asia in the handling of casualties on our highways and other civilian emergency situations requiring rapid evacuation and treatment of persons. The thoughts and ideas presented by CDR Hogue are very pertinent and it is believed their publication may serve as further impetus to the development of improved means of handling civilian medical casualties.

"In the face of a prediction that one of every five Americans will suffer serious or fatal injury during their lifetime due to automobile accidents, an exceptional interest in emergency medical services has

developed. In this connection, nothing has aroused more popular attention than the use of the helicopter as an ambulance. Because of its thousands of dramatic missions in search and rescue and its work in two wars as an attack weapon and an angel of mercy, a great deal of glamour surrounds the helicopter. Despite the glamour, however, a helicopter is merely a component in a system—a highly versatile component—but one that has only limited value unless it has proper system support. In its military employment, it is used in such a systems concept; if we are to see comparable results in the civilian sector, we must take a similar approach.

"The use of helicopters in the Armed Forces for airlift of troops, logistics, personnel transport, anti-submarine warfare and other tactical missions has afforded a mobility never before known. Perhaps, in no phase has this mobility been so striking as in

the evacuation of wounded troops from the scene of action.

During calendar year 1966, with only 61 helicopters available to it in Vietnam, the Army Medical Service, alone, accomplished 43,058 evacuation missions involving 64,488 patients. The cumulative total of patients evacuated in Vietnam through 1 August 1967 is over 125,000. Fifteen percent of evacuation sorties are flown at night, and weather has not been a significant deterrent due to the versatile flight characteristics of the helicopter.

"No soldier in Vietnam is more than 35 minutes away from a medical facility capable of giving definitive, resuscitative, lifesaving treatment. As a result, in Vietnam today, the American soldier wounded in battle has the best chance of survival of any war to date.

"Historically, advances in trauma management during wartime have been applied to similar problems facing the nation as a whole. It is appropriate that experience during unavoidable wartime "Epidemics of Trauma" be exploited in improving our national capability to provide better surgical and medical care for our citizens.

"Unfortunately, the experience of the Armed Forces in Southeast Asia, and of our world-wide Search and Rescue System, has not yet been applied to any great degree to a raging epidemic of mechanical and, to some extent, thermal injuries occurring in our own domestic environment on the highways.

"A fatal crash on the highway—an event that we live with daily—does not have the public impact of a plane crash or vessel sinking. Yet, the number of people killed annually in water and air accidents represents less than a three weeks' toll of highway deaths. The National SAR System, established at first to aid those at sea and expanded later to encompass the air, has traditionally been aimed at sea and air disasters and most SAR personnel think in these terms. The SAR organization will, however, respond to other types of distress when asked, and has done so in rescuing hundreds of hunters, fishermen and persons injured in remote locations, as well as a number of persons injured on the highways.

"Unfortunately, the total extent of this help by the Armed Forces cannot be determined at present as incidents are not reported by all commands. Some idea of the potential can be gained, however, from the reports of the Army crash rescue helicopter detachments at Fort Rucker, Alabama, which evacuated 30 highway accident victims in the 8 month period ending in June 1967, and at Fort Sam Houston, Texas, which evacuated 38 victims during

FY 1967. In the same year, the Coast Guard aided 334 victims of land accidents.

"The services have a deep vested interest in the highway casualty problem. In the 20 years following WWII, 97,000 members of the Armed Forces died in accidents, far more than were lost in combat. But there are drawbacks in the use of Armed Forces' helicopters.

"The basic authority of the military to aid those in distress is contained in the National Search and Rescue Plan of 1961, and this plan does not differentiate between those in trouble in the air, at sea, or on land, including the highways. But those in trouble at sea are assisted by an integrated military system, operated by the Coast Guard, which is also able to call for assistance from the other services. In the states, however, we are dealing with fifty different entities and, within these states, thousands of community units. The National SAR Plan not only authorizes military help but encourages SAR agreements between the military SAR Coordinators and the various states. It is a rare military commander who is not more than willing to cooperate to the best of his ability with the civilian authorities in his area, but many are limited in the help they can give.

"Though some 200 SAR-dedicated or SAR-available helicopters are located at over 50 military bases in the United States, most are located in the coastal areas and along the southern border of the country, and the great heartlands of the nation remain outside their effective radius of action.

"There are also, however, over 300 National Guard helicopters in the country, and their use for emergency medical evacuation offers considerable promise. The State of Nebraska, with funding assistance from the National Highway Safety Bureau, is preparing National Guard helicopters for use in this work and expects to have them in operation in a matter of weeks. Ohio National Guard helicopters, with medical personnel from the Ohio State University Medical School, have been used on test runs as well as in actual evacuations, and plans are under development to employ them regularly on emergency medical evacuations.

"Not only are the National Guard helicopters under control of the various governors and, thus, responsive to state needs, but if arrangements are made, they may be employed with little additional funding. Most training flights are on weekends, which coincide with the periods of heaviest traffic casualties, and helicopters may be diverted from training flights for air evacuation missions. At other

times, crews will have to be recalled, and longer delays will result.

"A number of states and municipal governments have also begun civil helicopter operations, and others will undoubtedly follow as they become aware of the helicopter's unique ability to solve many of their problems within economic constrictions. Nassau County, New York, has announced plans to acquire a helicopter after conducting tests that showed an accident victim could be transported to a hospital in less than a third of the time required by a surface ambulance. Pennsylvania, with funding assistance from the National Highway Safety Bureau, has already begun a year-long operation using helicopters for highway patrol and evacuation in the Greater Philadelphia area.

"North Carolina, with most of its major medical centers located in the center of the state, is investigating the use of helicopters to speed seriously ill or injured patients from outlying hospitals to heliports at the big medical centers. Medical groups elsewhere have discussed the feasibility of reducing the number of expensive but inadequate emergency rooms, bringing accident victims instead by air transport to well-prepared emergency departments at major hospitals. Many hospitals throughout the country have already installed heliports, and others are in the planning stage. They are not expensive to construct, and the Coast Guard has co-operated with hospitals in establishing them in nearly all locations where its helicopters bring in injured persons. If helicopter services are available, hospital heliports will quickly follow.

"The enthusiasm for the helicopter's ability to perform a variety of essential missions is dampened primarily by the cost factor. A helicopter, though far more adaptable to rescue and police work than a fixed wing aircraft, is also more expensive. If it is to be used economically on the highways, it must by necessity be a multi-mission machine that can be kept busy in such diverse missions as SAR, fire patrol, photography, personnel transportation, investigations, search for missing persons, detecting violations of aeronautical regulations, searching for stolen cars, and highway patrol, but, always, with a priority for evacuation of injured persons. In the helicopter's versatility lies justification for its increased costs, for with greater utilization its hourly cost drops greatly.

"In any operation requiring 24-hour coverage, personnel costs constitute a major part of the expense. For example, each ambulance operated by a typical large city government costs \$80,000 yearly,

of which over \$70,000 represents personnel costs. By comparison, a small helicopter operated by a city government costs \$120,000 yearly, of which \$100,000 is chargeable to personnel costs. As personnel costs are relatively independent of hours flown, the helicopter becomes a more economically effective machine as its operating hours increase. The cost effectiveness of a helicopter becomes even more pronounced if the operating area permits the faster helicopters to replace a number of ambulance or patrol cars. In a typical metropolitan operation, one small helicopter can be funded for the cost of 1½ ambulances.

"In view of the cost factor, is use of the helicopter feasible for emergency medical evacuation in the average state?

"If arrangements can be made to obtain the services of Armed Forces helicopters, it is certainly feasible, even if the state must provide the necessary communications required for coordination. The same applies to the use of National Guard helicopters. When we move into the situation where the state must fund for the machine and crew, however, the shoe begins to bind. If the machine can be kept employed on a multi-mission basis such as I have described, it can prove cost/effective, but it is unlikely that many states can afford helicopters just to stand by and evacuate victims of highway accidents, or that such limited use can be justified.

"Frankly, I cannot envision a helicopter being used in cases where a surface ambulance is nearby and can transport the victims as quickly to a nearby hospital. Certainly the use of a helicopter is not indicated where serious injuries are not involved. It should be used only when seriously injured persons are in remote or inaccessible locations (which includes traffic jams) where its arrival would be much quicker than surface transportation, or where victims must be transported from community hospitals, where they have been taken immediately after the accident, to more definitive medical care at a major medical facility.

"This latter eventuality is where the helicopter's potential is greatest. Many local hospitals are neither staffed nor equipped to handle severe trauma or some serious illnesses, and such cases often must be transferred to major medical centers after being stabilized at the community hospitals. The transfer should be by the fastest and most comfortable transportation, with qualified medical people in attendance. One surgeon has said, "We should regard the small community hospital in the context of a battalion first-aid post; an intermediate stop between the oc-

currence of the injury and definitive treatment".

"If we include not only seriously injured accident victims, but also other acutely ill individuals such as those with coronaries, who should be transported in this manner, the case volume may become such that the helicopter will prove effective cost-wise. If well-organized and serving a populous area, such an operation could become feasible for a private helicopter or ambulance operator.

"It is also absolutely essential that the potential users of helicopter service, the police, hospital, and ambulance people be made aware of the existence of such a service in their area, its capabilities and limitations and how to obtain the help. Unless this is done, its use will be sporadic and inefficient.

"As men particularly trained to support the requirements of aviation medicine, I am certain the time will come when you, too, will contribute to the development and operation of this new concept of greater service to the nation."—AeroMed, BuMed.

FIT TO FLY

The following article concerning unauthorized use of medications recently appeared in an issue of the U.S. Air Force Medical Service Digest. The information presented in this article is as apropos to Navy Flight Surgeons as it is to Flight Medical Officers in the Air Force. Therefore it is being reproduced in its entirety:

"A Potential Hazard Related to Medication Prescribed for Flying Personnel"

A problem has come to the attention of the USAF Medical Service concerning a potentially hazardous and unauthorized use of medications which could produce dangerous side effects.

One of our medical facilities has reported that a number of pilots' wives and other dependents are under weight-reduction programs sponsored by various civilian doctors. The medical facility has obtained copies of these programs and has classified the prescribed medications as far as possible. Three (3) of the tablets were thyroid crude extract, digoxin and sucrose. Several others were nonstandard and would require analysis.

An Air Force officer, who was not on flying status, visited one of these civilian doctors. This officer advised the doctor that he was overweight and would have to reduce in order to pass his periodic physical examination. The doctor entered him in his weight-reduction program which he declared would not have an undesirable effect, even on flying performance; further, that several Air Force and civilian pilots

were current participants under his program. The Air Force officer was then given 1 cc of mercurhydrin intramuscularly, another diuretic in the other arm, Oretic orally, digoxin and thyroid.

Since the above represents a potential hazard, all Flight Surgeons and Flight Medical Officers are requested to discuss this unauthorized practice with members of their flying organizations and also at professional staff meetings.

(Prepared by COL Howard R. Unger, USAF MC, AFMSPAB.)

Editor's Note: By the time this article appears, a change to OPNAVINST 3710.7D, NATOPS Manual, General Flight and Operating Instructions, should be in effect. This change will add a new paragraph to Chapter VIII covering the subject "Physical and Psychological Fitness of Flying Personnel". It will cancel OPNAVINST 3740.7, Fitness of Flying Personnel. This paragraph will provide excellent guidelines for Commanding Officers and Flight Surgeons in the handling of various areas concerned with the fitness of aircrew personnel, including dieting, self-medication and unauthorized medication. The aviation physiology film, MN 9929B, "Fit to Fly" is also recommended for use by Flight Surgeons to instruct their flying personnel on the do's and don'ts of physical and mental fitness.—AeroMed, BuMed.

NEWS OF PERSONNEL

Several familiar names in Navy Aerospace Medicine were "piped over the side" for the last time this past summer. These included CAPT W. M. (Mel) Snowden, who, for the past four years, had served as Assistant Chief for Aerospace Medicine, Bureau of Medicine and Surgery, and our Chief Flight Surgeon; CAPT C. P. (Cliff) Phoebus, who finished his naval career as Senior Medical Officer, Naval Air Station, Pensacola, Florida and Staff, Flight Surgeon, Naval Air Basic Training Command. Also ending their careers in Aerospace Medicine were CAPT J. O. M. (Joe) Thatcher as Senior Medical Officer, Naval Air Station, Memphis, Tennessee, and Staff Medical Officer, Naval Air Technical Training Command, and CAPT R. H. (Bob) Bradshaw, who retired as the first Commanding Officer, Naval Hospital, Patuxent River, Maryland. A well-done to all, we shall miss you and wish you fair winds and following seas!

CAPT L. P. (Len) Jahnke has assumed the position of Assistant Chief of Aerospace Medicine, better known as Code 5, from retired CAPT Mel Snowden. CAPT Jahnke, who has served as Direc-

tor, Aerospace Medicine Operations Division (Code 51) since April 1966, was relieved in that position by CAPT R. C. (Bob) McDonough. Other changes in Code 5 saw CAPT J. H. (Herb) Britton relieve CAPT N. W. (Newt) Allebach as Head, Aerospace Physical Qualification Branch.

On 1 July 1968 the Station Hospitals at six Navy air stations were redesignated and commissioned as Naval Hospitals. The Senior Medical Officers (Flight Surgeons) were named Commanding Officers. This change established these medical facilities as subordinate commands of the Bureau of Medicine and Surgery. The activities so designated and their commanding officers are as follows:

Naval Hospital CAPT S. T. (Sid) Brody
Quonset Point,
R.I.

Naval Hospital
Patuxent River,
Md.

CAPT R. H. (Bob) Bradshaw,
who was relieved by CAPT
R. B. (Dick) Nauman on 1
Sept 1968

Naval Hospital
Cherry Point,
N.C.

CAPT A. P. (Tony) Rush

Naval Hospital
Rota, Spain

CAPT R. E. (Bob) Mitchell

Naval Hospital
Lemoore, Calif.

CAPT J. A. (Jim) Niforopulos

Naval Hospital
Whidbey Island,
Wash.

CAPT V. E. (Vance) Senter

—AeroMed, BuMed.

EDITOR'S SECTION

DANGERS ASSOCIATED WITH OXYGEN THERAPY IN NEWBORN INFANTS

Discussion: The clinical picture of the hyaline membrane syndrome is characterized by increasing dyspnea almost invariably associated with cyanosis. It occurs primarily in premature infants. The pathologic alterations in the lungs include atelectasis and congestion, in addition, to the membrane which lines the dilated alveolar ducts and terminal bronchioles of those portions of the lung which are not collapsed. Premature infants are also susceptible to other causes of respiratory distress such as; pneumonia, aspiration, emphysema, and pneumothorax.

High concentrations of oxygen were used in the treatment of this condition until it was found that this treatment caused retrolental fibroplasia. For several years, therefore, it has been recommended that the oxygen concentration not exceed 40%, which has resulted in a marked decrease in the occurrence of retrolental fibroplasia.

The hyaline membrane syndrome is characterized by vast degrees of veno-arterial shunting (up to 80% of the cardiac output may be shunted around the lungs). The shunt channels include the foramen ovale and the ductus arteriosus and consequently, retinal-artery tensions may be considerably higher than in the descending aorta where the pressure is usually measured. The cause of the hyaline mem-

brane syndrome is not known nor is the critical level of PO_2 which is toxic to the eye and produces vasoconstriction. It is most important to determine the safe level of blood oxygen in treating premature infants.

The Subcommittee on Vision of the National Advisory Neurological Disease and Blindness Council has recently suggested that an ophthalmologist examine each infant with hyaline membrane syndrome daily and an arterial blood specimen be drawn at the same time for oxygen determination.

Recent studies have also suggested that oxygen administered to premature infants may cause pulmonary hemorrhage and death.

Action: Oxygen administration to premature infants should be very carefully monitored and used only when specifically indicated. The oxygen concentration should be kept at the lowest possible level.

It is suggested that premature infants with respiratory distress should be observed daily by an ophthalmologist whenever possible. A protocol for a combined multi-hospital study of this problem is under consideration.

All personnel concerned with the treatment of respiratory difficulty in infants should be familiar with the recent developments concerning oxygen therapy. A recent editorial in the New England Journal of Medicine, 277:878 entitled "Premature

Infants in Priestley's Pure Air" is recommended reading.

References

1. Editorial. Premature Infants in Priestley's Pure Air. *New England Journal of Medicine* 277:878, Oct 19, 1967.
2. Shanklin, D. R. and Wolfson, S. L. Oxygen as a Cause of Pulmonary Hemorrhage in Infants. *New England Journal of Medicine* 277:833, Oct 19, 1967.
3. Stahlman, M. T. et al. Prognosis in Hyaline Membrane Disease. *New England Journal of Medicine* 276:303, Feb 9, 1967.
4. Correspondence, *New England Journal of Medicine* 278:280, Feb 1, 1968.

HEPATITIS PROPHYLAXIS

The necessity of gamma globulin prophylaxis for infectious hepatitis was emphasized recently by the promulgation of BUMED Notice 6230 of 2 August 1968. This Notice called particular attention to the need for administering gamma globulin to all personnel assigned ashore in Vietnam.

The effectiveness of pre-exposure prophylaxis for infectious hepatitis is documented by several studies both in the United States and abroad. Available morbidity data indicates that, over a 24-month period, U.S. troops in Vietnam, who did not receive the gamma globulin pre-exposure prophylaxis, had a hepatitis case incidence rate four times greater than U.S. troops who did receive gamma globulin prior to arrival in-country.

The BUMED Instruction 6230.13B, Subj; Prophylaxis for Infectious Hepatitis, of 3 March 1966, indicates that gamma globulin shall be given within two weeks prior to arrival in Korea and mainland countries of Southeast Asia, including Vietnam. However, this Bureau has learned that, due to various administrative and logistic difficulties, many personnel are reporting for duty in Vietnam without this most important immunization.

In accordance with paragraph 3 of the aforementioned Notice and in order to afford optimum protection against infectious hepatitis for the individual as well as for the entire command, it is strongly recommended that the prescribed dose of gamma globulin be administered by the command detaching personnel for duty in Vietnam even though the period elapsed before reporting might, in some instances, be longer than two weeks.—PrevMedDiv, BuMed.

NAVAL RESERVE HOSPITAL CORPSMEN COMPLETE REFRESHER TRAINING

A group of twenty-three Naval Reserve Hospital Corpsmen recently completed an intensive two week course of instruction at the Naval Hospital, St. Albans, New York under the direction of Master Chief Hospital Corpsman Emanuel S. Ratner, USNR,

NR Surface Division 3-63(L), NRTC, Freeport, N.Y. This year Reservists came from all over the THIRD and FOURTH naval districts as well as from Naval Air Reserve units in Brooklyn, N.Y., and Washington, D.C. Many various occupations were found among the trainees ranging from school teacher, registered nurse, laboratory technicians, medical supplies salesman, police officer, postman, physical therapist, social worker, doughnut and coffee shop owner, students, and others.

CAPT R. E. Faucett, MC USN, Commanding Officer of the Hospital, (Rear Admiral Selectee), welcomed the reservists personally and conducted a personnel inspection which he stated was outstanding.

This, the fourth such school, since its conception in August 1966, featured accentuation of independent duty techniques and situations found in Southeast Asia duty. Medical and Medical Service Corps officers, Nurses, and corpsmen, many of whom were Vietnam war veterans, featured the program of instruction. Besides the many lectures and demonstrations, practical work through watches in the laboratory, pharmacy, emergency room, and wards was given. The benefits of having a group come on ACDUTRA was again demonstrated by the interest and eagerness of the Hospital staff to impart information to the Reservists. HMCM Ratner, originator of the course, was given able assistance by the Hospital In-Service Training Dept., headed by LCDR Joan MacEnery, NC USN, and HM1 Harold Brown, USN.—Naval Reserve Training Center, Freeport, N.Y.

OPHTHALMOLOGY ASSOCIATION RECOGNIZES NAVY TECHNICIANS

Navy Hospital Corpsmen who have completed formal training as Eye, Ear, Nose and Throat Technicians can apply for registry as Ophthalmic Medical Assistants with the American Association of Ophthalmology (AAD). The AAD established the American Registry of Ophthalmic Medical Assistants several years ago for the purpose of registration and identification.

This is a free service for the benefit of all ophthalmologists and ophthalmic medical assistants endorsed by the ophthalmologists. One of the many purposes of the Registry is to facilitate contact between potential employers (Ophthalmologists) and trained experienced ophthalmic assistants, civilian and military, who become available for employment.

Forms for application to the Registry may be requested directly by writing to:

The American Registry of Ophthalmic
Medical Assistants
The American Association of Ophthalmology
1100 17th Street, N.W.
Washington, D.C. 20036

Eye, Ear, Nose and Throat Technicians (NEC HM-8484) who have completed the formal school for Eye, Ear, Nose and Throat Technicians may forward the application through their commanding officer to the Bureau of Medicine and Surgery, Attn: Code 34. This division will certify the application as the "Physician Employer" or appropriate military authority, and will forward the completed forms to the Executive Offices of the American Association of Ophthalmology in Washington, D.C., for registration with the association.

All registered ophthalmic assistants are eligible to receive pins identifying them as Medical Assistants in Ophthalmology. These pins are available at the nominal cost of \$3.00.—Public Affairs Office, BuMed.

BUMED FILM RELEASES

The following new films may be found in Hospital Film Libraries and Training Aids Centers:

MN-8190—*First Aid for Strains and Sprains*—16mm—color, sound, 21 minutes. Explains the structure and function of muscle, tendon, and ligament. Depicts the signs, symptoms, and first-aid treatment for strains and sprains.

MN-10198—*Hygiene for Men: Personal Health*—16mm—color, sound, 19 minutes. Facts and principles of personal health for men—fitness, exercises, posture, cleanliness, food, eating habits, and grooming.

MN-10211C—*Disease Recognition: Leishmaniasis (World Medicine Series)*—16mm—color, sound, 24 minutes. Film presents signs and symptoms, some epidemiology and differential diagnosis of the disease Cutaneous and Mucocutaneous Leishmaniasis (Oriental Sore, American Leishmaniasis), in a manner to test diagnostic skill of student physicians or physicians desiring to refresh their acumen for disease recognition.

CARCINOMA OF THE BLADDER

Current research on cancer of the bladder holds the promise of continued gains in patient survival through earlier diagnosis, the National Cancer In-

stitute reports in a new public information pamphlet released by the National Institutes of Health.

Although one of the rarer types of malignant disease, bladder cancer strikes most frequently between ages 50 and 70, and three out of four victims are men. Of patients whose tumors are localized when treatment is started, 68 percent are alive and well five years later. Surgery is the treatment of choice, but other methods are used in some cases.

One diagnostic technique under study would use a test to detect in the urine cancer cells sloughed off from the interior bladder wall. A similar technique is largely credited with a reduction of nearly 50 percent in deaths from uterine cancer in the last 30 years.

Another new detection technique utilizes the ability of tumor cells to absorb an antibiotic called tetracycline and then fluoresce under ultraviolet light.

A new treatment method under investigation involves peeling off the affected bladder mucosa, or lining. It quickly regenerates without increased risk of cancerous infiltration, preliminary research results indicate.

One known cause of bladder cancer is occupational exposure to a chemical compound, betanaphthylamine, used in the aniline dye industry. An association with smoking has also been reported in several studies. The explanation advanced is that smoking appears to reduce the body's ability to break down tryptophan, an amino acid found in proteins. Although the products of complete tryptophan breakdown are harmless, some of the incomplete breakdown products, which are cancer-causing, may accumulate in the bladder and give rise to a tumor. The pamphlet mentions that a recent laboratory study showed a marked increase in the amount of these materials in the urine of cigarette smokers.

Repetitious appearance of blood in the urine is the single most characteristic symptom of bladder cancer, although this symptom is more often due to other causes, such as infection or bladder stones.

The National Cancer Institute is one of the several research divisions of the National Institutes of Health. With funds appropriated annually by Congress—which totaled \$183,356,000 for the fiscal year 1968—it conducts research in the NIH laboratories and clinics at Bethesda, Maryland and supports research and training by non-Federal institutions and organizations through grants and contracts.—USDHEW NIH, National Cancer Institute, Bethesda, Md.

DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON, D.C. 20390

POSTAGE AND FEES PAID
DEPARTMENT OF THE NAVY

OFFICIAL BUSINESS

PERMIT NO. 1048

MEDNEWSLZC11

1
ELEANOR EKBERG LIBRARIAN
MED TECH LIBRARY
BOX 375
MADIGAN GENRL HOSPITAL
TACOMA WASHINGTON
98431